FOUNDATION AND EARLY HISTORY OF JAIPUR CITY

THESIS

SUBMITTED FOR THE AWARD OF THE DEGREE OF

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IN

HISTORY

By

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Under the supervision of

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ABSTRACT

The present theme of Ph.D. thesis deals with the process of foundation and early history of the Jaipur City, from its foundation in 1727 A.D. till the death of its founder Sawai Jai Singh in 1743 A.D. Though, many works have been done on the political life of Sawai Jai Singh and his achievements in Astronomy, no serious attempt has been made to study the process of the foundation of the Jaipur City along with its early history during the life time of Sawai Jai Singh. It also comprises the town planning and organization of space into different functional units, with water conservation and management system. Further more his rare contribution in the field of mathematics and his efforts in institutionalizing the scientific knowledge in India would be emphasized anew. Hence, the present study is an attempt to fill this gap in Indian History in general and Rajasthan History in particular.

Jaipur, after its foundation, acquired the fame as one of the most graceful and planned cities - based on 'Grid-Iron Pattern' of street planning - of India, where it emerged as one of the major cities of Northern India during the18th century.

Though, the eighteenth century is generally considered as a period of stagnation and general decline in India, scholars are widely divided on its nature. A group of historians in their monumental works came out with their conclusion that there was a general decline in the 18th Century because of the decline of the

Mughal Empire, though they have cited different causes of the decline of the Empire. Later on a number of scholars have challenged the whole thesis of general decline so far as eighteenth century India is concerned, and declared that the eighteenth century was not a period of overall decline in India and it was a period of economic prosperity – growth of trade and commerce and emergence of some new cities - and cultural progress at the regional level.

In context of the above mentioned debate, it is very imperative to assess foundation of Jaipur in the wider scenario of the eighteenth century. The present study helps not only to show Jai Singh's efforts and achievements but also contributes and gives a new direction to the 'Eighteenth-Century Debate'. It will definitely change our understanding of the 18th Century India and helps in understanding its history and culture in a proper perspective.

An attempt has been made to analyze the factors which were responsible for the transfer of the *Kachhwaha* Capital from Amber to the newly built city of Jaipur, its founding process and planning, fortifications, buildings, city as a centre of scientific learning- particularly Astro-mathematical, the motives, approach and methodology behind Jai Singh's scientific pursuits, together with the problem of institutionalization of the scientific learning in India. Jaipur as a centre of trade and commerce, an estimation of the city's population, its hydraulic system - rain water management, its conservation and supply, and the structure and functioning of its administrative system along with elements of change and continuity in different related fields, have also been given due space in the present work.

The whole work has been divided into seven chapters, besides introduction and conclusion. An outline of the chapters is as follows:

The first chapter is divided into two sections – (A) geographical profile and (B) historical background. The first section deals with the geographical features of the Jaipur City, such as, its location and situation; topography– land, soil and its texture; dimensions of the city and its geographical limitations; weather and climate – temperature, rainfall, winds, etc.; sources of water- rivers, lakes, ponds, etc.; agricultural conditions; flora and fauna; and natural resources of the region. The second section analyses the historical background of the region- particularly the political developments in the state of Jaipur (Amber), from its origin in the 11th Century till the period of Sawai Jai Singh (first half of the 18th Century), along with the origin and nomenclature of the State's ruling dynasty.

Second chapter is composed of two parts- (A) foundation of the Jaipur City and (B) town planning of the City. The first part contains five sub-sections. In its first sub-section, factors responsible for the shift of the *Kachhwaha* Capital from Amber to Jaipur, has been discussed. Second sub-section analyses the founding process of the Jaipur City. Third sub-section deals with the grant of Imperial recognition to the new Capital City. Fourth sub-section deals with the ruler's invitations to different socio-economic classes of the State to build their shops and houses in the newly founded city. And, the fifth sub-section evaluates the nomenclature of the localities. The second part consists of three sub-sections, besides discussing the concepts of town planning in its introductory part. The first sub-section analyses the historical background of the Grid-Iron System of street planning in India before Jaipur. Second sub-section, on the basis of the physical survey and contemporary sources, explains and evaluates the town planning of the walled city of Jaipur. The last sub-section discusses about the town planners of the city.

Third chapter is consisted of six sections. The first section deals with the physical description of the city walls and its gateways. Second section discusses general characteristics of the commercial buildings i.e. shops, and houses on the main roads or the chief markets. Second section explains the features of the building within the Palace Complex, such as, entry gateways, Palace, *Diwan-i-Am*, *Diwan-i-Khas*, royal garden and temple, and other buildings within *'Sarhad'* or the boundary of the Palace Complex. Forth section deals with *havelis* or the mansions- their structure and location, and other buildings within the walled city. Fifth section deals with buildings in the outskirts of the city, such as, 'Jal-Mahal' or the Water Palace, 'Ghat-ki-Guni' or the 'Purana-Ghat' and the Jaigarh and Nahargarh forts. The Mughal influence on building architecture of Jaipur is also discussed in this section. The last section informs about the building material used in the construction of buildings in the city.

Forth chapter defines foundation of the Jaipur City as a centre of scientific learning. It composed of four sections. First section analyses literary activities at Jaipur under the patronage of Sawai Jai Singh. Second section evaluates the scientific - Astro-mathematical, pursuits of Jai Singh, his objectives, and approach and methodology followed by him. In this section, special attention has been given to his mathematical contribution - particularly in the field of theorization. Third section estimates the scientific work of Jai Singh, his achievements in the fields of Astronomy and Mathematics and his limitations. A comparative approach has been adopted in analyzing his work. And, finally the forth section highlights the problem of institutionalization of the scientific knowledge in India, and various degenerative factors which led to the stagnation and decline of the scientific temper in India, especially after Sawai Jai Singh.

The fifth chapter entitled "emergence of the city as a commercial hub" is composed of six sections. The first section deals with the trade-routes connecting the Jaipur City from different trade centers, and the means of transportation in the first half of the 18th Century. Second section analyses the socio-economic structure of society, classification of different commercial groups and an estimation of the city's total population, in the mid-18th Century, has been estimated by two different methods. Third section deals with the marketing system in the City-markets, their agencies and their organization, and items of transaction. Forth section deals with the main industries of Jaipur, including the royal manufacturing departments. Fifth section elaborates the taxation system- nature and types of taxes and fines collected from different commercial classes. The last section estimates the state-policy towards various commercial groups and the role of state in promoting trade and commerce.

Sixth chapter explains and analyses the water management system at Jaipur, as evolved by Sawai Jai Singh. It deals with the sources of water- seasonal rivers and rain water collected in the hilly regions and its valleys, and their channelization through artificial canals. Water conservation and its management, through a number of water bodies, such as, lakes, dams, ponds, tanks, wells and step-wells, interconnected by a network of masonry canals and underground aqueducts or conduits, is given due space in this chapter. The general architectural features of these water bodies are also discussed in this chapter.

The last chapter evaluates and analyses the structure and functioning of the administrative system in the Jaipur City, as modified and implemented by Sawai Jai Singh. This chapter consists of four sections. The first section deals with duties and functions of the city-officials, their co-ordination with the state-officials, and fixing of their responsibilities both locally and collectively. Second section deals with the intelligence service or the spy system as evolved by Jai Singh. Third section analyses the structure and working of the judicial system of government in Jaipur. The last section deals with the role of the city-officials in the collection of different taxes and fines.

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CERTIFICATE

This is to certify that **Mr. Abdul Salam** worked under my supervision on the topic "***Foundation and Early History of Jaipur City***". This thesis is the original work of the candidate and I find it suitable for submission for the award of the Degree of **Doctor of Philosophy** in History.

(Dr. M.K. Pundhir)
Supervisor

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ABBREVIATIONS

Allah.	*Allahabad*
AMU	*Aligarh Muslim University*
Camb. Uni.	*Cambridge University*
Comp.	*Compiled/ completed*
Dept.	*Department*
Ed.	*Edited*
I.N.S.A.	*Indian National Science Academy*
Lib.	*Library*
M.A.L.	*Maulana Azad Library (Aligarh)*
M.S.M.S.	*Maharaja Sawai Man Singh II Museum (City Palace, Jaipur)*
Osm. Uni. Hyd.	*Osmania University Hyderabad*
Oxf. Uni.	*Oxford University*
Pub.	*Publication*
Pt.	*Part*
Rep.	*Reprinted*
R.H.C.	*Rajasthan History Congress*
Rev. ed.	*Revised Edition*
R.O.R.I.	*Rajasthan Oriental Research Institute*
Tod's Annals	*Annals and Antiquities of Rajasthan*
Tr.	*Translation/ Translated*
V.S.	*Vikram Samvat (Indian Era)*
W. Hunter	*"Some Accounts of Astronomical Labour of Jaya Sinha of Ambbere of Jayanagar", Asiatic Researches (Calcutta), Vol.V (1799), ff.177-212.*

INTRODUCTION

The present theme of Ph.D. thesis deals with the process of foundation and early history of the Jaipur City, from its foundation in 1727 A.D. till the death of its founder Sawai Jai Singh in 1743 A.D. Though, many works have been done on the political life of Sawai Jai Singh and his achievements in Astronomy, no serious attempt has been made to study the process of the foundation of the Jaipur City along with its early history during the life time of Sawai Jai Singh. It also comprises the town planning and organization of space into different functional units, with water conservation and management system. Further more his rare contribution in the field of mathematics[1] and his efforts in institutionalizing the scientific knowledge in India would be emphasized anew. Hence, the present study is an attempt to fill this gap in Indian History in general and Rajasthan History in particular.

Jaipur, after its foundation, acquired the fame as one of the most graceful and planned cities - based on 'Grid-Iron Pattern' of street planning - of India, where it emerged as one of the major cities of Northern India during the18th century.

Though, the eighteenth century is generally considered as a period of stagnation and general decline in India, scholars are widely divided on its nature. A group of historians in their monumental works came out with their conclusion that there was a general decline in the 18th Century because of the decline of the Mughal Empire[2], though they have cited different causes of the decline of the Empire[3]. Later on a number of scholars have challenged the whole thesis of general decline so far as eighteenth century India is concerned, and declared that the eighteenth century was not a period of overall decline in India and it was a period of economic prosperity – growth of trade and commerce and emergence of some new cities - and cultural progress at the regional level[4].

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[1] Still no attempt has also been made to study his equally important achievements in the field of mathematics- particularly in theorization i.e. finding and defining the natural patterns from the astronomical observations, and predicting mathematically the future phenomena, and in the Intelligence Service- codification of the secret messages.

[2] Habib, Irfan, *Agrarian System of Mughal India, 1556-1707*, Bombay, 1963. Prof. Irfan Habib concludes that the 18th Century was a period of general decline in India, as he assigns it a period of 'reckless rapine, anarchy and foreign conquest' as a result of decline of the Mughal Empire, ibid, p.351.

[3] William Irvine (*Later Mughals*, ed. J. Sarkar, 2 Vols, Calcutta, 1922) and Jadunath Sarkar (*Fall of the Mughal Empire*, 4 Vols, 2nd ed., Calcutta, 1971) suggest that the personal flaws, of the Emperors and their nobles, were the main factor behind the decline of the Mughal Empire. Satish Chandra (*Parties and Politics at the Mughal Court, 1707-1740*, Aligarh, 1959) and Irfan Habib (ibid.) give emphasis over the structural inherence weaknesses in the Mughal Administrative System i.e. Jagirdari and the economic crises respectively, which were responsible for the downfall of the Mughal Empire. While as, M. Athar Ali took more broader perspective of the debate in his essay "Passage of the Empire" where he attributes the decline of all major Asian States including the Mughal Empire in India of that period to what he calls 'Cultural Failure' to their confrontation with the West –Athar Ali, M., *Mughal India: Studies in Polity, Ideas, Society and Culture*, ed. by Prof. Irfan Habib, New Delhi, 2006.

In context of the above mentioned debate, it is very imperative to assess foundation of Jaipur in the wider scenario of the eighteenth century. The present study helps not only to show Jai Singh's efforts and achievements but also contributes and gives a new direction to the 'Eighteenth-Century Debate'. It will definitely change our understanding of the 18th Century India and helps in understanding its history and culture in a proper perspective.

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[4] C.A. Bayly in his '*Rulers, Towns, and Bazars: North Indian Society in the age of British Expansion, 1770-1870*' emphasizes that the Mughal Empire, by its fall, in fact, rendered a service by letting a large number of indigenous groups develop and so enabled a number of networks – established by local castes, and communities and immigrant groups, together with merchants and moneylenders – to flourish. And he suggests the British expansion might in the beginning have hurt some of these groups, but ultimately represented a compromise with many of them[4]. The older theories of the eighteenth century have also been challenged by many other scholars, though they have not dealt with the issue over such a range as Bayly has done. Muzaffar Alam[4], for example, has also been concerned with the first half of this century. Frank Perlin with Maharashtra ("State Formation Re-considered", *Modern Asian Studies*, Vol.XIX, pt.3, Cambridge, 1985, pp.415-80.), Satish Chandra's essay is brief and concentrates again on Indian Polities (*The 18th Century in India: Its Economy and the Role of the Marathas, the Jats, the Sikhs and the Afghans*, Calcutta, 1986, pp.1-40.). S.P. Gupta in his work *The Agrarian System of Eastern Rajasthan, 1650-1750* (Delhi, 1986, pp.1-37.) finds out that how Amber Ruler strengthens his position in the first half of the eighteenth century in Eastern Rajasthan and thus essentially converted a *zamindari* or the fief into a local sovereignty. In many ways, however, these writings represent departures from the older theories, though their authors do not necessarily agree with Bayly. Andro Wink is among those who totally accepted Bayly's view of the Empire and the Marathas (*Land and Sovereignty in India – Agrarian Society and Polities under the Eighteenth Century Maratha Soarajya*, Cambridge, 1986). Muzaffar Alam's work offers much promise. The empire in its heyday had contributed to prosperity, and its autonomous segments continued to do so in the 18th Century. He mentions, "Both the Punjab and the Awadh registered unmistakable economic growth in the 17th Century in both provinces, polities and administration appear to have moved along similar lines (*The Crisis of Empire in Mughal India*, *op.cit*, p.12.).

The whole work has been divided into seven chapters, besides introduction and conclusion. An outline of the chapters is as follows:

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[5] For this purpose, the 'Preface' to his own work *Zij-i-Jadid Muhammad Shahi* has been utilized extensively.

Sixth chapter explains and analyses the water management system at Jaipur, as evolved by Sawai Jai Singh. It deals with the sources of water- seasonal rivers and rain water collected in the hilly regions and its valleys, and their channelization through artificial canals. Water conservation and its management, through a number of water bodies, such as, lakes, dams, ponds, tanks, wells and step-wells, interconnected by a network of masonry canals and underground aqueducts or conduits, is given due space in this chapter. The general architectural features of these water bodies are also discussed in this chapter.

The last chapter evaluates and analyses the structure and functioning of the administrative system in the Jaipur City, as modified and implemented by Sawai Jai Singh. This chapter consists of four sections. The first section deals with duties and functions of the city-officials, their co-ordination with the state-officials, and fixing of their responsibilities both locally and collectively. Second section deals with the intelligence service or the spy system as evolved by Jai Singh. Third section analyses the structure and working of the judicial system of government in Jaipur. The last section deals with the role of the city-officials in the collection of different taxes and fines.

CHAPTER FIRST

GEOGRAPHICAL AND HISTORICAL BACKGROUND

(A) GEOGRAPHICAL PROFILE

The city of Jaipur is situated at 26° 55' north of latitude and 75° 50' east of longitude lying about 300 kms south-west of Delhi and 240 kms west of Agra. It exists on the Agra-Ajmer Trunk Road[1] in an irregular valley[2] on the northern limit of the Alwar hills of North Arawalli mountain system[3], among steep hills which encompass the city on the north, east, and west, opening only towards the south. In the south there is an open space[4], known as basin, which might have been the bed of a dried-up lake[5]. Jaipur is the largest city in the erstwhile Rajputana[6], its area including suburbs, being about 23 square kilometers[7].

The whole geographical area below the city is surrounded by the hills having peaks and a number of water bodies. Almost all the peaks of surrounding hills are occupied by forts.[8] These hills are members of the North-Arawalli ranges. The range on the north-eastern side belongs to the Alwar hills while those in the east belong to the Lalsot hills[9]. Jaipur is surrounded by Nahargarh, Jaigarh, Ganeshgarh and Shankargarh, and further by Raghunathgarh and Ambagarh in the north and south of Galtaji, all existing on the high peaks of hills. In this way a defense line around the city through these fortifications was created[10]. Nahargarh fort seems to be built to supervise the city, the rock face of which is scarped on the south or city side, while on the north the ridge slopes towards Amber.[11] The main elevation of the peaks are 648 m at Jaigarh, 599 m at

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[1] *The Imperial Gazetteer of India-Gyaraspur to Jais*, V. XIII, Oxford, 1908, New Ed., Faridabad, p.399.

[2] Walter Hamilton, *The East India Gazetteer*, V. 2, London, 1828, Rep., Delhi, 1984, p. 41.

[3] Savitry Gupta, *Rajasthan District Gazetteer-Jaipur*, Government of Rajasthan, Jaipur, 1987, p. 5.

[4] *The East India* Gazetteer, *Op.cit*; Shyamaldas, *Vir Vinod*, (Hindi) V.II, Rep., Delhi, 1986, p. 1261.

[5] Thornton Edward, *A Gazetteer of the East India Company*, 1858, Rep., Delhi, 1984, p. 446.

[6] In the British period the area of Rajasthan (a sanskriticized form of the Dingal word Rayathana) was called 'Rajputana'. According to Tod, Rajputana stood for Raethana. It was also known as 'Rajwada', which meant abode of the Rajas (James Tod, *Annals And Antiquities of Rajasthan*, V.I., 1832, rep., 2002, N. Delhi, p. 1). In the 18th century, Rajasthan comprised chiefly of the principalities of Mewar, Marwar, Jaipur (Amber), Bikaner, Jaisalmer, Kota, Bundi and Sirohi. It was bounded by the Mughal provinces of Delhi in the north, that of Agra in the east, Malwa in the south-east, Gujarat in the south and Multan and Sindh in the west, B. L. Gupta, *Trade and commerce in Rajasthan during the 18th century*, Jaipur, 1987, p.1

[7] *The Imperial Gazetteer of India*, *op.cit*, p. 400.

[8] Ibid.

[9] Rajasthan District Gazetteer-Jaipur, *op.cit.*

[10] Jain, Shikha, *Princely Terrain: Amber, Jaipur & Shekhawati.*, Gurgaon, 2005, p. 105.

[11] *The Imperial Gazetteer of India*, *Op.cit*

Nahargarh, 786 m at Barwara, 747 m at Manoharpura, 775 m at Bilali and 656 m at Bichun[12].

The centre of the Jaipur City is an elevated table land of triangular form having elevation of 430 to 500 meters above see-level. It is bound on the south by a base-line running west from the city of Jaipur; the eastern boundary consists of hills running north and south along the Alwar border. Towards the north and west this plateau is bound by a broken chain of hills, a portion of the Aravalli range. The highest elevation of the triangle is near Khetri in Shekhawati. This range of hills on the north-west forms a natural boundary between the sandy desert tracts of Shekhawati and Bikaner on the one side, and the more fertile soils of Jaipur on the other.[13]

To the east of Jaipur, beyond the range of hills, there is a rapid fall of 100 to 130 meters in the first three-five kilometers, after which there is a gradual fall along the valley of the Banganga River to the Bharatpur border (in the extreme east); here the land becomes gradually more open. To the south of latitude of Jaipur City, the country slopes gradually to the south-east towards the Banas River, only a few hills appearing above the plain; but in the extreme south the hill-ranges reappear. Westward from Jaipur City the country rises gradually towards the Kishangarh border and consists of a great measure of broad open treeless plains, dotted with occasional hills. The hills for the most part rise very abruptly from the plains and many of them are peaked; others are flat at the top with the edges steeply scarped for some way down the hillside, thus forming natural fortifications.[14]

The soil of Jaipur, immediately west and north of the city, is generally sandy while as in some places there are tracts of mere barren sand.[15] An extensive dune field covers the western part to the city in the Sambhar-Jobner-Renwal-Ramgarh tract. Sand dunes are present along the border of Sikar district to the north of Jaipur City. The hills prevent the movement of sand particles and, therefore, deposition of sand is a regular feature near the foot hills particularly during the summer season[16]. Eastward along the Banganga valley, the soil is usually a rich loam; and in the extreme east, towards

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[12] *Rajasthan District Gazetteer- Jaipur*, *Op.cit*

[13] Ibid, pp. 382-83; Shyamal Das, Kavi, *Vir Vinod*, Vol. II, Rep., Delhi, 1986, pp. 1246-47.

[14] Sarkar, J.N., A *History of Jaipur*, Rev.& Ed. By Raghubir Singh, Hyderabad, 1984, pp.2-3

[15] Ibid., p. 3

[16] *Rajasthan District Gazetteer-Jaipur*, *Op.cit*, pp. 5-6.

Hindaun, it is still sandy. Southward from Jaipur the soil is, for the most part, rich and fertile; and the tract to the extreme south, enclosed by the Banas River, consists of a rich alluvial loam, and is the most fertile portion of the region. Shekhawati, to the north of the Aravalli range, consists almost entirely of shifting sands, and the great scarcity of water prevents the growth of any other than the Kharif Crop (moth, bajra and guwar) rose during the rains.[17]

Bishop Heber when arrived at Jaipur in 1820s beautifully sketched the topography of this region as:

> "...our own tract emerged on an elevated but sandy and barren plain, in which, nevertheless, some fields of wheat were seen, and what surprised me, some fine peepal-trees. This plain which seems to have been a lake, is surrounded on three sides by the same barren stony hills, and has in its centre the city of Jaipur, a place of considerable extent, with fortifications so like those of the Kremlin, that I could almost have fancied myself at Moscow..."[18]

The main axis of the city i.e. the east-west axis, aligned with the natural ridge running at a slight angle of 15 degrees to the south-east. Stretching in line with the foot of Nahargarh hill on the west for about 4 kilometers till the sand dunes on the foot hill of Galtaji this ridge now exists as the main road from Surajpol to Chandpol[19]and the distance between these two gates is about 3.2 kms. Its breath, south to north i.e., from Ajmeri Gate to the foot of Nahargarh fort, is about 2 kilometers[20].

The region where Jaipur City exists is depended on the scanty source of water in the absence of any perennial river. Source of water consists of rainy water which was harvested in the form of lakes, tanks, etc. and ground water approached through wells and step-wells. Jaipur City and area around is consisted of a number of water bodies i.e. natural or man-made. There is a small water body popularly known as Talkatora, and the lodge which was being used by *Kachhwahas* for hunting purposes.[21] *Budhivilas* (18th c source) mentions the construction of a hunting lodge in the Talkatora area of Jaipur by Mirza Raja Jai Singh which was later on developed by Sawai Jai Singh as his favourite hunting ground[22].On the north and east of Talkatora, there was a bigger water body known as the Rajamal Ka Talab, spread in an area of about 100 acres infested with crocodiles. Unfortunately, it was filled up and lost its practical existence. To the north of Talkatora about 2.5 kms away there was a marshy land (having a flowing water stream) which was later converted into a lake[23]. In the central and eastern divisions of the region, water is fairly near the surface, varying from a few feet in low-lying ground to 30 or 40 feet.[24]

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[17] Sarkar, A History of Jaipur, *Op.cit.*

[18] Thus, Bishop Heber precisely defines the location of Jaipur City, Heber, Reginald, D.D., *Narrative of a Journey through the Upper Provinces of India, From Calcutt to Bombay, 1824-25,* Rev., IIIrd ed., Vol. II, London, 1828, pp. 397-98.

[19] Jain, Shikha (ed.), *Princely Terrain, Op.cit.*, pp.99-100.

[20] Sarkar, *A History of Jaipur*, p. 206.

[21] Ibid, *p.* 98.

The general direction of drainage is towards south in the southern part of Jaipur; towards east in the eastern part and towards north-east in the northern part.[25] The Banas, which rises in the Aravalli hills, flows through, or along the border of the present Jaipur District. It has numerous tributaries, such as the Dain, the Mashi, the Dhil, the Galwa, and the Morel. The Banganga, a river of Jaipur, is about 145 kilometers, flowing first in a south-easterly direction and then almost to the east. Among other rivers are the Bandi, a tributary of Mashi[26], originated from hills near Samod in Jaipur District, passes through Phulera and Phagi tahsil before entering the Tonk district. The Mash, a tributary of Banas, originates from Ajmer district, traverses through Phagi tahsil. The main tributary of Morel River is Dhund. It traverses in Chaksu (Chatsu) tahsil before joining Morel River near village Hingonia. The Morel originates in Dosa tahsil and is tributary of river Banas, and it enters in Sawai Madhopur district. The Sabi River originates in Neem-ka-Thana tahsil, and it enters Jaipur district in Viratnagar tahsil and traverses in north-eastern direction.[27]

The 'Amani-i-Shah' or 'Amani Shah-Ka-Nala' originates in the foothills north of the Jaipur City, it supplies the city with sweat drinking water, and joins the Dhund south of Sanganer after flowing 35 kms, in it water sustains whole year[28]. The Mendha flows into the Sambhar Lake; the Sabi or Sahibi, which flows north-east into Alwar, and thence through Kot-Kasim, which after a northerly course of some 95 kms through Shekhawati, loses itself in the sand just within the Bikaner border. Almost all the minor rivers are dry during the summer months. The only natural lake of any importance is the salt lake at Sambhar, which is famous as one of the largest source of salt in the country, the eastern portion of which was jointly held by Jaipur and Jodhpur Darbars[29].

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[22] Parrikh, N and Kishore, *Rajmahal aur Raniwas* (Hindi), in *Rajasthan Patrika*, Jaipur, 1984, p.6.

[23] Roy, AK, *History of the Jaipur City*, New Delhi, 1978, p. 46.

[24] Sarkar, *A History of Jaipur*, *Op.cit*, p. 3.

[25] *Rajasthan District Gazetteer- Jaipur*, *Op.cit*, p.5.

[26] *The Imperial Gazetteer*, *Op.cit*, p. 383; cf. *Vir Vinod*, Vol.II, pp. 1248-49.

[27] *Rajasthan District Gazetteer- Jaipur*, *Op.cit*, p.7.

[28] *Vir Vinod*, *Op.cit*, p.1249.

Jaipur is a City of harsh climate and seasonal variations as temperature going as high as 48° c in summer and very cold in winters with temperatures dropping below 10°c. The annual rainfall averages about 57 centimeters, of which 50 centimeters are received in the three months of July, Aug. and Sept., and it is 62 centimeters in the City[30]. Writing about the climate of Jaipur, Heber says,

> "The climate of Jyepoor is described as less disagreeable than I should have expected. The rains are never heavy, the cold months are bracing and healthy, and the hot winds, fierce during the day, generally cease at night".[31]

Winds are generally light to moderate but in summer and the early south-west monsoon season, winds may strengthen on some days. Westerly or south-westerly winds prevail in the south-west monsoon season. In the post monsoon and winter months winds are mostly south-westerly. In the summer season the winds blow from direction between south-west and north-west[32].

Agricultural conditions vary in different parts of the Jaipur region. Shekhawati consists almost entirely of shifting sands, and generally produces only one harvest in the year, raised during the rainy season, i.e. *Kharif* harvest. This consists of *bajra, mung, guwar* and moth (lentil), and a little wheat and barley are grown in winter season (*Rabi* harvest). To the east of the City, along the Banganga Valley, the soil is for the most part either black cotton or a rich alluvial loam. Here *jawar*, cotton, and *til* (oil seed) are grown in the rains, while the winter season crops are wheat, barley, gram, sugar cane and poppy[33].

The Jaipur Region is characterized with a particular type of flora and fauna. The following trees are common: *babul* (*Acacia Arabica*), *ber* (*Zizyphus Jujuba*), *dhak* (*Butea frondosa*), *dhokra* (*Anogeissus pendula*), *gular* (*Ficus glomerata*), *jamun* (*Eugerica*

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[29] *The Imperial Gazetteer of India*, *Op.cit*, p. 383.

[30] *The Imperial Gazette of India*, *Op.cit.* p. 384.

[31] Heber, *Narrative of...*, *Op.cit*, p. 400; *Vir Vinod*, Vol.II, *Op.cit*, p. 1257.

[32] *Rajasthan District Gazetteer- Jaipur*, *Op.cit*, p. 18.

[33] Ibid, p. 389; Sarkar, *A History of Jaipur*, *Op.cit*, p.5.; *Vir Vinod*, Vol.II, *Op.cit*, p.1252.

jambolana), *khair* (*Acacia Cateahu*), *nim* (*Melia azadirachta*), *and peepal* (*Ficus religiosa*), and in the south, *shisham* (*Dalbergia sissoo*) and bamboo[34]. Jaipur has no particular bread of cattle or horses, the camels of Shekhawati are of a good stamp, being strong and hardy. Sheep and goat are reared[35]. The better known wild animals found in the area are tiger, hyaena, wolf, bear, sambhar, deer, pig, etc [36].

Jaipur is popular for the mining of some metals and the building stones. The salt, which is a very important item of trade, is largely manufactured at the Sambhar Lake. Iron occurs near Khetri, and at Karwar close to Hindaun, but the mines have long been abandoned; but in this neighbourhood, particularly at Babai, cobalt found in a thin layer between the veins of copper is much used for emanating.[37]

Good building stone, chiefly sand stone and marble, is plentiful. At Bhankri, 36 miles east of the City, and at Toda Rai Singh in the south-west, huge slabs of a foliated mica schist are quarried, and are used for roofing and flagging purposes. Course grey marble comes from Raiala near the Alwar border; and a black marble, used for inlaying work, is obtained at Bhainslana near Kot Putli in the north-east. Abundance of excellent limestone is procured from Rahori, about 14 miles north-east of the City, and Kankar is found almost everywhere; generally in flat beds instead of in scattered nodules. Garnets of the best kind are fairly common in the Rajmahal hills near the river Banas in the south-west, and turquoises are said to have been found in Toda in the same neighborhood[38].

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[34] *The Imperial Gazetteer of India, Op.cit*, p. 391; *Vir Vinod*, Vol.II, *Op.cit*, pp. 1251-52.

[35] Ibid, p.390.

[36] *Rajasthan District Gazetteer- Jaipur*, *Op.cit*, p.14.

[37] Shyamaldas,, *Vir Vinod*, Vol.II, Rep., Delhi, 1986, pp. 1246-47; ibid.

[38] Ibid, p. 392; *Vir Vinod*, *Op.cit*, pp. 1247-48.

PHYSICAL MAP OF JAIPUR

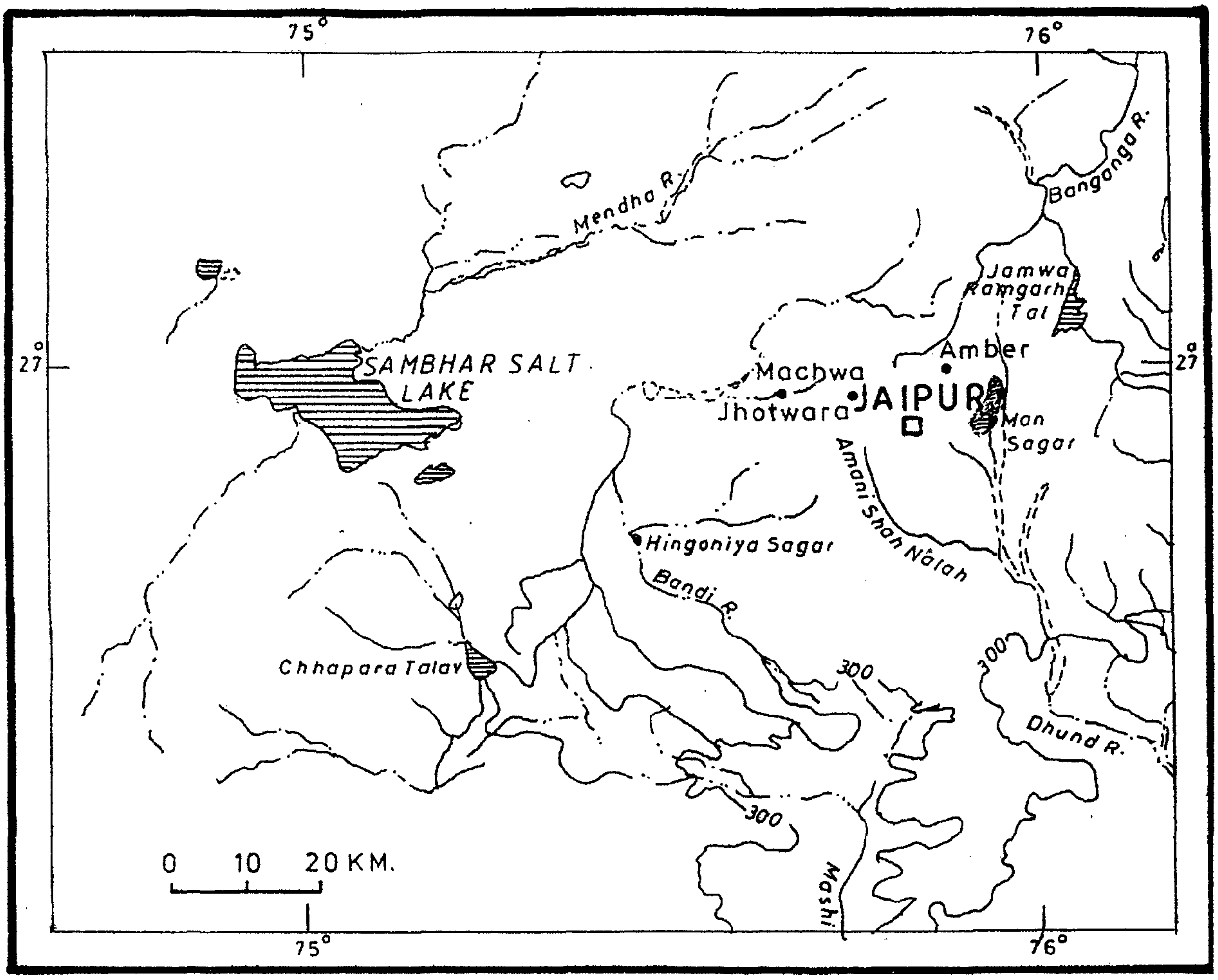

Fig.1

(B) HISTORICAL BACKGROUND

The territory now comprising the city of Jaipur (Amber) was the capital of the *Kachhwaha* Rajputs, existing in a region which was known in ancient and medieval times as 'Dhoondhar'[39], and formed a part of the *Matsyadesh* or *Matasya Janapada* of the Mauryan period[40]. It was till early twelfth century, held partly by the Minas and partly by the Rajputs of the *Badgujar* clan[41]. Among the Minas there were five leading families who were known as the *Panch-wara* or Confederacy of Five and who had long tracts of the country (south-east of the present city of Jaipur) under their sway[42]. But they were neither well organized nor well led and suffered from perpetual mutual feuds. Though, the family of Amber was regarded as a senior house, the *Badgujars* were sovereign to Minas and many of the forts of the region were occupied by them. The main among *Badgujars* was the Raja of Deoti to whom the Minas used to appeal, as to a sovereign, whenever they were in trouble[43].

The Minas were later on ousted by *Kachhwaha* Rajputs whose three families ruled on either side of the Chambal River. One family ruled at Gwalior (10-12th c.), the second family was that of Dubkund (11th c.) and the third one was that of Narwar which ruled in the eleventh and twelfth centuries. Of these three the most important was the dynasty which ruled at Gwalior from about 950 to 1128 A.D[44]. Whether it was the Narwar branch or the Gwalior branch of the *Kachhwahas* who migrated to Eastern Rajasthan can not be definitely determined because the traditions are conflicting and confusing[45]. Many conflicting versions of the origins of *Kachhwaha* settlement, in the land they now hold, have been written down from oral tradition only in the eighteenth century[46].

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[39] Bhargava , V.S., *Rise of the Kachhwas in Dhundhar(Jaipur),* Ajmer , 1979, p. 1; According to James Tod, the etymology of Dhoondar is from a once celebrated sacrificial mount (*d'hoond*) on the western frontier, near Kalik Jobner, James Tod, *Annals and Antiquities of Rajasthan,* p .280.

[40] Jain, Shikha (ed.), *Princely Terrain:Amber,Jaipur and Shekhawati,* Gurgaon, 2005, p. 12.

[41] *Rajasthan District Gazetteer-Jaipur,* Jaipur, 1987, p. 25.

[42] Sarkar, J.N., A *History of Jaipur, C.1503-1938, rev.* & ed., Raghubir Singh, Hyd., 1984, p. 22-23.

[43] Ibid , p. 23 ; *Rajsthan District Gazetteer-Jaipur* , p. 1

[44] Bhargava, *Rise of the Kachhwas in Dhundhar, p .4; Rajasthan District Gazetteer-Jaipur, Op.cit.*

[45] Ibid.

[46] Sarkar , *A History of Jaipur* , p. 22.

Bardic literature and tradition holds that the founder of Dhoondhar's *Kachhwaha* dynasty, Prince Dulha Rai or Tejkaran[47] was a descendant of a branch of the solar dynasty that traced its origins from Kush, one of the twin sons of Rama[48]. On the basis of the few genealogies and literary works, such as the *Kachhavamsha Mahakavya* and *Kurma Vilas*, it can be established that Dulha came from Gwalior. However, writers such as Nainsi, Bankidas and Tod, believe that Dulha Rai came originally from Narwar near Gwalior[49].

There are several theories regarding the origins of the name of the clan *Kachhwaha*[50]. In the Balban inscription of 1288 A.D., Chatsu inscription of 1499 A.D., Sanganer inscription of 1601 and Rewasa inscription of 1604 A.D., the *Kachhwaha* has been mentioned as *Kurmas* or *Kurmbha.* The term '*Kachhawa*' became more popular during and after the reign of Raja Man Singh-I, in the second half of 16th century[51]. Pt. Jhabarmal Sharma, while dealing with the origin of the clan's name, is of the opinion that on immigration to *Kachhawaghar* from Rohtasgarh, the invaders found the region ruled by the *Kachhapas* (of Chambal), whom they conquered. In honour they assumed proud title of '*Kachhapaghat*', '*Kachhap-ari*', '*Kachhapha*' which in its corrupt form is the *Kachhawa* or *Kachchwaha* of today[52]

The early history of this family is obscure; but they are said to have settled at Rohtas on the Sone River[53], where they constructed a fort, then they migrated towards west, and founded the kingdom and city of Narwar near Gwalior and ruled before and during the 11th Century[54]. According to popular tradition and bardic chronicles, Dulha Rai left Gwalior around 1128 V.S. /1071A.D.[55] and subdued Badgujars and Minas and settled at Dausa, 48 km east of Jaipur[56]. Thus, Dausa became the first capital of the *Kachhwahas* in Dhundhar[57]. Later on he expelled the Minas from Manchi, 22 km north-east of Jaipur, which he named as Ramgarh and from Khoh. Dulha now turned to crush the Bargujar's fort of Deoti and became master of its accumulated treasure. Khoh[58] (along with two other forts) 8 km east of Jaipur City, was taken from its lord, a Mina named Chanda, and it became Dulha's capital[59]. Then Getor, 3 km north-east of Sanganer, formerly held by Geta Mina, was annexed, followed by Jhotwara; 5 km west of the modern city of Jaipur. Dulha employed the Mina youths as watchmen and permanent servants of the State[60].

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[47] Shyamaldas, Kaviraj, *Vir Vinod,* V.II, Rep.,Delhi, 1986, p.1261; *The Imperial Gazetteer of India,* V.XIII, Oxford,1908 ; Sarkar, *Op.cit.* ; Tod confuses Dulha with Dhola who lived eleven centuries earlier, James Tod, *Annals and Antiquities of Rajasthan*, p. 28.

[48] Sarkar, *A History of Jaipur*, p.20; *Vir Vinod,* Vol.II, *Op.cit.*

[49] Bhargava , *The Rise of the Kachhwas in Dhundhar*, p.4; *The Imperial Gazetteer of India,* XIII, p.384.

[50] Jain ,Shikha (ed.), *Princely Terrain*, p.48

[51] Bhargava , *Rise of the Kachhwas in Dhundhar*, pp. 2-3

[52] Ibid, p. 2; *Kachhapa* or *Kurma* is shortened form of *Kachhapaghada*, V.S. Bhatnagar, *Life and Times of Sawai Jai Singh*, Delhi, 1974, p. 4.

[53] *The Imperial Gazetteer of India, Op.cit.*

[54] Bhargava , *Rise of the Kachhwas in Dhundhar*, p. 21

[55] So far as the departure of Dulha Rai from Gwalior is concerned, Shyamaldas is of the opinion that he left Gwalior around 976 A.D. James Tod also agrees with him but V.S. Bhargava does not accept it, *Vir Vinod,* V.II., p.126, Tod, *Annals and Antiquities of Rajasthan*, V.II, p. 280, Bhargava, *Rise of the Kachhwas.in Dhundhar*, f.n.3, p. 4.

The successor of Dulha Rai, Kakil captured and occupied Amber from Rao Bhutto, a Mina of the Susaot family, and laid the foundation of the fort of Amber. Kakil was also credited to found a new fort known as Kakilgarh[61]. Later on the *Kachhwahas* established matrimonial alliance with Prithviraj Chauhan of Ajmer and accompanied him in battles of Terrain. The bard Chand Bardai, has sung a lot about Pajvan, a contemporary *Kachhwaha* king, in his famous epic, *Prithvi Raj-Raso*[62]. The History of the *Kachhwahas* from Pajvan's successor Malesi to Prithvi Raj is full of legendary accounts. The only fact which deserves our notice is that they multiplied into a number of clans[63].

In the beginning of the 16th Century, *Kachhwaha* king Prithvi Raj, joined the Rajput Confederacy formed by Rana Sanga and participated in the battle of Khanwa against Mughal Ruler Babar[64].He is famous in the history of Amber for assuming twelve

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[56] *Rise of the Kachhwas in Dhundhar*, p.4; *The Imperial Gazetteer of India*, V.XIII, pp. 384-285.

[57] Sarkar , *A History of Jaipur*, *Op.cit*, p.22

[58] As per a long-standing tradition, it was the Minas of Kali-Kho, who were displaced from their position of local supremacy by the coming of the *Kachhwahas* and were entrusted with the protection of the state treasures of Kachhwaha-ruled Dhundhar. According to some 19th century records, although this custom had gone out of practice, the application of the 'raj tilak' the mark of coronation, on the forehead of the Kachhwaha kings had formerly been a privilege given to the *Meenas* of Khoh, Todd, *Annals and Antiquities of Rajasthan*, V.II. pp.347-348 ; Fateh Singh, *Brief History of Jeypore State*, 1889, p. 10

[59] He established his authority over a territory of 80 km in length and 50 km in width and to keep the newly conquered territory under his control he shifted his capital from Dausa to Khoh, M.L.Sharma, *History of Jaipur State*, p. 23.

[60] Sarkar , *A History of Jaipur* , *Op.cit*, pp .23-24.

[61] Ibid, p. 24

[62] Sarkar, *A History of Jaipur*, f. n. 10, p. 30.

[63] Bhargava, *Rise of the Kachhwahas in Dhundhar*, f. n .2, pp .7-8

[64] Ibid. p.8 ; Sarkar, *A History of Jaipur, Op.cit*, p.31.

appanagas i.e. *Bara-Kotris* to his sons and their successors[65]. The holders of these *Kotris* formed the highest nobility in Amber[66]. His successor Puranmal, who ruled from 1527 to 1534[67], helped Hindal (Humayun's brother who held the fief of Mewat) in his struggle against Tatar Khan and died fighting in the battle[68]. The period from the death of Puranmal to the accession of Bharmal is shrouded with controversies, quick successions resulting in intrigues, murders, etc.[69]

With the inception of Akbar's period, the history of *Kachhwahas* has entered into a new phase. When Mughal ruler Akbar came to the throne and fought initially to establish Mughal Empire, Dhoondhar was being ruled by Bharmal who became the king of *Kachhwahas* in 1548 A.D. In this period, a new political equation between Amber and the Mughal Empire began to establish[70].

During the initial phase of his reign, Bharmal was faced with considerable opposition, not merely from various relatives who were rival contenders to the throne, but also from Haji Khan Pathan, a former slave who became a military commander of Sher Shah Suri, and the Mughal Subedar of Mewat Mirza Muhammad Sharifuddin Husain. While Bharmal was managed to placate Haji Khan Pathan, Husain supported the cause of Suja, a son of king Puranmal[71], and in 1558, Mirza Husain led a large army to Amber, which Bharmal was in no position to resist. He came to terms, promised a fixed tribute to Mirza and handed over his son Jagannath and his nephews Raj Singh and Khangar Singh as hostages for its due payment[72]. But Mirza Sharfuddin was not really satisfied. He made preparations, with a large force, for renewing the invasion next year (1562) and extirpating the family of Bharmal and annexing Amber[73]. At the same time, insecurity arisen due to the expansionist policy of Marwar ruler Maldeva who occupied some territory of Amber. In these circumstances, while facing internal and external problems as well, Bharmal sought Akbar's protection[74] through Chaghtai Khan, a Mughal noble, and met the Emperor, then on his way to Ajmer, at Sanganer, 11 km south of Jaipur, and on the advice of Chaghtai Khan and Maham Anaga, offered his daughter's hand to the Emperor.

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[65] James Tod, *Annals and Antiquities of Rajasthan*, V.II, p.285 ; Sarkar, *A History of Jaipur*, p. 32

[66] Bhargava, *Rise of the Kachhwahas in Dhundhar* , *Op.cit*, p. 9

[67] Sarkar, *A History of Jaipur*, p.33; Bhargava put his period from 1528 to 1536 A.D., cf. Bhargava, *Rise of the Kachhwas*. p. 9

[68] Bhargava, *Rise of the Kachhwahas in Dhundhar* , *ibid.*

[69] Ibid., p .9

[70] Jain, Shikha (ed.), *Princely Terrain*, *Op.cit*, p. 56; cf. Sarkar, *A History of Jaipur* , p .34.

[71] Ibid., pp. 56-57.

[72] Sarkar, *A History of Jaipur*, *Op.cit*, p. 35.

[73] Ibid, pp.35-36.

The marriage was solemnized at Sambhar in Feb.1562, when Akbar was on his way back from Ajmer to Agra[75]. Bharmal's eldest son Bhagwandas and his grandson Man Singh were attached to the Emperor and accompanied him to Agra[76]. This marriage was a significant event in medieval Indian History. The little principality of Amber attained sudden prominence after Feb.1562, and was destined to play an important role in the medieval period[77].

The political alliance between the state of Amber and the Mughal King was immensely advantageous to both the parties. Bharmal succeeded, without any battle, in regaining his lost territory from Raja Maldeva of Jodhpur, and in making Sharfuddin desist from his aggressive designs on Amber[78]. The *Kachhwahas*, before their alliance with Akbar, were a non-entity among the ruling tribes of Rajasthan. They had occupied the rich eastern plains of Rajasthan and were always exposed to the attacks of the rulers of Agra and Delhi. Amber, their capital, was very often under the influence of one or the other of its powerful neighbours. With his accession opens a completely new chapter in the history of Amber[79].

Thereafter, the state of Amber became one of the most prominent Rajput states not only in Rajasthan, but in the whole of northern India. In the words of M.L.Sharma, "The policy initiated by Beharimal and pursued by his worthy successors was responsible for the high prestige the princely house of the Kachhwas enjoyed in the Mughal Court, the brilliant military career which the *Kachhwaha sardarsor* or the leaders obtained in Mughal service, and the continuous peace and prosperity which about two million subjects of Amber enjoyed for about two centuries before the Marathas appeared on the horizon. Raja Beharimal's house supplied the Mughals the cool penetrating brain power, the unfailing political insight and the great administrative skill, as also the inborn power of leadership of generals like Man Singh, Mirza Raja Jai Singh"[80].

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[74] Abul Fazl has given detailed account of Bharmal's submission in *Akbarnama*, V.II, Eng. Trans., pp. 240-244.

[75] Bhatnagar, *Life and Times of Sawai Jai Singh*, *Op.cit*, p.8

[76] *Akbarnama*, *Op.cit*; cf. Sarkar, *A History of Jaipur*, p. 36.

[77] Bhargava, *Rise of the Kachhwahas in Dhundhar* , *Op.cit*, p .13

[78] *Rajasthan District Gazetteer-Jaipur*, *Op.cit*, p. 29.

[79] Cf. Bhargava, *Rise of the Kachhwahas in Dhundhar* , p.10

The alliance also secured solid and loyal support of the *Kachhwahas* to the Mughal throne and became an important cause of the empire's expansion and stability. It produced a profound effect on Akbar's imperial policy as well as personal life[81].The *Kachhwahas* to begin with, and the other Rajputs who followed their example, supplied the Mughal monarch with the greatest strength in the troubled days of the new born empire[82]. Long before his death, Bharmal was appointed to the rank of 5000, which was the highest position conferred upon the person outside the Mughal family, and during the two Gujarat campaigns; Akbar even left the capital in his charge[83]. Moreover, Akbar left his infant son Daniyal to the care of Bharmal's rani[84].

Bharmal's son Bhagwandas (1574-1589A.D.) held the title of *Amir-ul-Umra* and the rank of 5000. He played an important role in the campaigns in Rajputana, Gujarat and Kashmir, and served as the Subedar of Lahor from 1583 to 1589 A.D.[85] In the battle of Sarnal (1572A.D.) Bhagwandas has distinguished himself and was therefore honoured with the grant of a standard and a Kettle drum. He saved Agra in 1573 from the surprise attack of Ibrahim Husain[86]. His daughter Man Bai (afterwards known as Sultan-un-Nisa) was married with Prince Salim (later Jahangir)[87]. Marriage was performed according to Hindu and Muslim customs[88]. He died in Nov.1589, and was succeeded by his son, Man Singh who ruled from 1589 to 1614 A.D.[89]

First as a prince and then as the ruler of Amber, Man Singh took part in as many as sixty-seven important Mughal military campaigns and battles (including the famous battle of Haldighati, which was fought against Maharana Pratap of Mewar in 1586 A.D) that took him from Kabul, Balkh and Bukhara in the north-west to Bengal in the east, as well as the southern and central part of the sub-continent[90]. In recognition of his accession, Emperor Akbar sent Man Singh the ceremonial coronation *teeka* along with an order conferring the title of 'Raja' with a *mansab* of 5000[91], which later increased to the highest 7000 (the only equal Mughal *mansabdar* was Mirza Aziz Koka)[92]. From his times, Amber became one of the best known and the prosperous states in the country. The Raja united ability with courage and genius with strenuous action; he administered the province of Bihar excellently[93].

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[80] Sharma, M.L., *History of the Jaipur State,* pp. 43-44; cf. Sarkar, *A History of Jaipur*, p 40.

[81] Bhargava, *Rise of the Kachhwahas in Dhundhar, Op.cit,* pp. 13-14.

[82] *Rajasthan District Gazeteer-Jaipur, Op.cit,* p. 28.

[83] Bhatnagar, *Life and Times of Sawai Jai Singh, Op.cit.*, p. 9.

[84] Cf. Bhargava, *Rise of the Kachhwahas in Dhundhar,* p.15.

[85] Bhatnagar, *Life and Times of Sawai Jai Singh , Op.cit.*

[86] Bhargava, *Rise of the Kachhwahas in Dhundhar, Op.cit,* pp. 16-17.

[87] Ibid. p.21.

[88] Bhatnagar, *Life and Times of Sawai Jai Singh, Op.cit,* pp. 9-10.

[89] According to Tod, Man Singh was the most brilliant character of Akbar's Court, cf. Tod, *Annals and Antiquities of Rajasthan.,* V.II, p. 286.

In 1605 A.D, after summoning Man Singh from Bengal, Akbar being highly pleased with his glorious feats there rewarded him with a *mansab* (official rank) of 7000 *zat* and 6000 *sawar*[94]. The five-coloured flag or '*Panchranga*' of the Amber State (which continued to be used until after Dhoondhar's integration into independent India) is said to have been designed by Man Singh[95].

Man Singh was considered as one of the nine jewels (*nav-ratna*) of Akbar's court, and was renowned for his skills as a warrior and general, as well as an able administrator and diplomat. Man Singh encouraged scholarship, literature, poetry, architecture, and the arts. Moreover, he himself was well versed in Sanskrit, Persian, Rajasthani and Hindi. '*Pothikhana*' the private library of the Amber-Jaipur rulers was mainly the collection of Man Singh's period. It was during his reign that aspects of the Imperial administrative pattern, such as the use of the '*Pargana*', a group of villages, were introduced[96].

A large number of buildings were built by Man Singh. It mainly includes palaces within Amber fort, the Man-Mandir, Man-Ghat and Sarovar-Ghat at Varanasi, the Govin-Deva temple at Vrindavan, and the temple of Pushkar and Puri. Moreover, Man Singh was also responsible for the construction of the forts at Salimpur (Bengal), Manihari (Bihar), and Ramgarh (Dhoondhar), and founded the towns of Akbarnagar (Rajmahal) and Manpur (near Gaya) as well as the small township of Baikunthpur (Bihar's Patna district). He also adopted Bengali architectural features in his later constructions at Amber[97].

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[90] Cf. Shikha Jain (ed.), *Princely Terrain, Op.cit,* p. 59.

[91] Ibi*d.* p. 61.

[92] Cf. Bhargava, *Rise of the Kachhwahas in Dhundhar,* p. 31.

[93] Ibid, p.36.

[94] Ibid, p.39.

[95] Jain, Shikha (ed.), *Princely Terrain.., Op.cit,* p.61.

[96] Ibid, p.63. The size of the parganas varied, with each comprising 400 to 1000 villages. In 1715, the pargana of Amber consisted of about 700 villages, and by 1737, it had grown to 998, *ibid,* f.n.23, p.77.

After the death of Man Singh in 1614 A.D, Bhau Singh became the King of *Kachhwahas* with recognition of Mughal Emperor Jahangir. He was also conferred the title of 'Mirza Raja'. His *mansab* or the rank was increased to 4000 *zat* and 3000 *sawar*[98], and he was later on given the rank of a '*Panch Hazari Mansabdar*' (rank of 5000)[99]. After his death, Bhau Singh was succeeded by eleven year old Jai Singh-I who was better known as Mirza Raja Jai Singh. His rank was increased to 2000[100]. He fought under the Imperial banner in every part of the empire, from Balkh in Central Asia to Bijapur in the Deccan, from Kandhar in the west to Monghyr in the east. In the first decade of Aurangzeb's reign, after Mir Jumla's death, he attained an eminence and position of importance[101].

In the long period of his rule from 1622 to 1667 A.D, Jai Singh-I got the opportunity to serve under three Mughal Emperors- Jehangir, Shah Jahan and Aurengzeb, and obtained innumerable *jagirs* and other honors for his contributions to the Mughal Empire. In recognition of his brilliance and meritorious service, Jai Singh's rank was increased from 1000 to 7000, which was a privilege usually reserved for the Mughal princes. Mirza Raja was soon proved his worth as an able worrier, tactical commander, and diplomat[102].

Jai Singh started his military career under the Mughals by fighting against the rebel Prince Khurram (later Shah Jahan). During Jai Singh's absence Khurram looted Amber (April, 1623). In the battle of Hajipur (1634) which the Mughal army fought against Khurram, Jai Singh was posted in the reserve with his 5000 horses. Jai Singh was with Mahabat Khan when the latter chased Khurram from east to the Deccan. He did not take part in the civil war following the death of Jahangir. But on receiving a call from Emperor Shah Jahan he reached Delhi (1627A.D.), posted in the Deccan along with Khan Jahan Lodi whom he deserted when the Khan revolted against Shah Jahan. In the same year his *mansab* was raised to 4000 *zat* and 3000 *sawar* and *Khayat*, studded sword and *Nakhara* were awarded to him. In 1630 A.D., his *mansab* was raised by 1000 *sawar*. He was also granted jagir worth 37,48820dams in pargana Deoti Sanchari in appreciation of the meritorious services rendered by him[103].

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[97] Bhatnagar, *Life and Times of Sawai Jai Singh*, *Op.cit*, p. 10.
[98] Ibid, p. 42.
[99] Jain, Shikha(ed.), *Princely Terrain*, *Op.cit*, p. 64; cf. Sarkar, *A History of Jaipur*, p. 97.
[100] Sarkar, *A History of Jaipur*, *ibid*, p. 98.
[101] Ibid, p.99.
[102] Ibid.

Jai Singh earned fame in the conquests of Balaghat, Gulbarga and Bijapur in the Deccan, as a reward of which he was appointed as *Subedar* of Akbarabad (Agra) and Faujdar of Mathura in June, 1631A.D. with an increment of 4600 sawar and 5,20,00,000 dams in *Inam* (gift)[104]. Shah Jahan's Farman to Jai Singh dated 26th *Jamadi-ul-Akhir*, 1043A.H (18thDec.1633) which is preserved in *Kapad-Dwara* (No.176/R) informs us that the land utilized for the Taj-Mahal belonged to him and in compensation for the plot of land, four *havelis* or the mansions belonging to Bhagwan Das, Madho Singh, Roopji Baigi and Chand Singh son of Swarup Singh were granted to Maharaja Jai Singh[105]. His services in the Deccan campaigns were appreciated by the Emperor. As a result he was promoted to the rank of 5000 and the Pargana of Chatsu was added to his Jagir[106].

In March, 1638 A.D, he was deputed along with Prince Shuja to take possession of the fort and the district of Qandhar, which its Persian governor Ali Mardan Khan had offered to hand over to the Emperor and there he was given the title of '*Mirza Raja*', like his great-grand father Man Singh, who had received a similar honour from Akbar[107]. For many years Jai Singh rendered his services on the north-western frontier of the Empire, including Kabul and Qandhar, under the command of the Mughal princes Shuja (1638), Murad (1641), Dara Shikoh (1642) and Aurengzeb (1648)[108]. In 1644 A.D, Jai Singh was appointed the Governor of the Deccan, where he ruled for two years and impressed the Emperor with his administrative ability[109]. From 1649 to 1653A.D, he was mostly engaged in the three sieges of Qandhar, which were proved great failure. But Jai Singh's role in every siege was courageous and creditable[110].

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[103] Bhargava, *Rise of the Kachhwahas in Dhundhar, Op.cit,* p. 45.

[104] Ibid, p. 46.

[105] Bahura, G.N, *Catalogue of Historical Documents in Kapad-Dwara, Jaipur*, Jaipur,1988, Cat. No.176-77, pp. 25- 26.

[106] Bhargava, *Rise of the Kachhwahas in Dhundhar, Op.cit,* p. 47.

[107] Ibid, pp. 47-48.

[107] Ibid, pp. 47-48; cf. Sarkar, A *History of Jaipur*, p. 104.

[108] Jain, Shikha (ed.), *Princely Terrain., Op.cit,* p.65.

[109] Cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, p. 48.

[110] Sarkar, *A History of Jaipur, Op.cit,* p. 49.

Jai Singh's role in the war of succession among the sons of Shah Jahan reveals him a practical and shrewd politician, an opportunist, loyal to the throne and not to the person[111]. The great achievement of his career was treaty of Purandhar (June, 1665) and his role in persuading Shivaji to visit the Mughal Capital. Shivaji's escape from Agra and the failure of the Bijapur campaign clouded the glory of Mirza Raja Jai Singh. Due to an accidental fall from his elephant, he died in 1667A.D. at Burhanpur[112].

After the death of Mirza Raja, the Emperor recognized Ram Singh (r.1667-1689 A.D.) as the ruler of Amber with the rank of 4000/4000, an elephant[113], and 20 parganas were also assigned to him[114]. Ram Singh served at Jalalabad, Lamghan, Ali Masjid, Gandamak, and Ghazni and proved his administrative talent[115]. After the death of Ram Singh in 1688 A.D, he was succeeded by Bishan Singh (r.1688-1700 A.D.)[116]. In July 1688, he was deputed to protect the caravans between Mathura and Agra. He gained rapid promotions in Imperial service. In Aug.1688, he was appointed *Faujdar* of Mathura with an increase of 500 *zat* in his rank for having captured Pithor and Kasot forts of the Jats. In Jan.1690, he rendered out standing service in capturing Sinsani fort[117].

Bishan Singh's operations against the Jats were appreciated by Aurengzeb who granted him zamindari of Sinsim in view of his good services. The pargana of Malarana, which was earlier taken away, was restored to him in Sep.1689. Zamindari of Sonkh was granted to him in Nov.1689[118]. later on Bishan Singh had captured Soghar (1691), Harsoli (1693), Kasehrar (1693), Sonkher (1694), Pinghar, Batholi (1694), Jawahar-Ki-Garhi (1695) and a number of other Jat fortresses[119] (50 such mud forts were taken and demolished by his son Jai Singh II)[120]. In 1692, he was granted Faujdari of Hinduan and Bayana, Pargana of Chatsu, Tonk, Malpura and Dausa. Kol (Aligarh) with 50, 00,000 dams were granted to the Maharaja, in lieu of his success against Jats. He died at Peshawar on Dec.19, 1699 A.D[121].

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[111] Cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, p. 50.

[112] Bhatnagar, *Life and Times of Sawai Jai SinghII, Op.cit*, p. 11; *Akhbarat* (Jaipur), Sep.6, Oct.30, 1667, *Kapad-Dwara*, Jaipur

[113] Ibid, p.11.

[114] Bhargava, *Rise of the Kachhwahas in Dhundhar, Op.cit*, p. 56.

[115] Bhatnagar, *Life and Times of Sawai Jai Singh, Op.cit.*

[116] Ibid, p. 12.

[117] Ibid, pp. 13-14.

[118] Cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, p. 62.

[119] Bhatnagar, *Life and Times of Sawai Jai Singh, Op.cit.*, p. 14.

[120] Cf. Sarkar, *A History of Jaipur*, p. 153.

After the death of Bishan Singh, Jai Singh-II (r.1700-1743A.D.) ascended the throne of Amber on Jan. 25, 1700A.D[122]. A few days later the Emperor conferred upon him the title of Raja Jai Singh and upon his brother the title of Bijay Singh[123], and his *mansab* has been increased from 1000/1200 to 1500/1200[124].

With the accession of Jai SinghII, the history of Jaipur (Amber) enters a new stage[125]. Since the accession of Man Singh after the death of Bishan Singh the *Kachhwaha* rulers were absentee rulers for their principality[126]. At the time of his accession only three parganas (Amber, Dausa and Baswa) constituted *watan jagir* (home territory) of the Kachhwaha Raja, which yielded an annual income of Rs.3, 80,000 and having area about 5,000 square kilometers[127].

Soon after his coronation, Jai Singh was called upon to render military service to the Mughal Empire[128]. Prior to his accession, Jai Singh had served in the Deccan for about eight months when he was a ten year old, and in his first meeting with Emperor Aurengzeb, he received the famous title of '*Sawai*'(literary one and a quarter)[129]. Once he became the ruler of Amber, Jai Singh was again sent to the Deccan. This time he was posted under Prince Bidar Bakht[130]. During the next few years, the young Raja and his contingent demonstrated their military worth on many occasions, particularly against the Marathas at Khelna, Khandesh, Malwa and Burhanpur[131]. Emperor Aurengzeb was a witness to Jai Singh's valour at the time of conquering the fort of Khelna. His mansab was raised by 500zat making him mansabdar of 2000 *zat* 1200 *sawar*[132].

His appointment in 1705 as Deputy Governor (*Naib-Subedar*) of Malwa similarly helped him refine those skills pertaining to administration, law and order, revenue collection, and statesmanship. Among Jai Singh's various responsibilities was the safe transit of treasures intended for the Imperial treasury, and of arms and ammunition to the Deccan[133].

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[121] Bhatnagar, *Life and Times of Sawai Jai Singh*, p.18; cf. Bhargava, *Op.cit.*

[122] Ibid, p.19; cf. Bhargava, *Rise of the Kachhwahas in Dhundhar,* p. 66.

[123] Ibid.; Shyamaldas, *Vir Vinod*, *Op.cit,* p. 1298 ; Sarkar, *A History of Jaipur* , *Op.cit,* p. 19.

[124] Ibid.

[125] Cf. Sarkar, *A History of Jaipur*, p. 156.

[126] Bhargava, *Rise of the Kachhwahas in Dhundhar, Op.cit,* f. n. 1, pp. 63-64.

[127] Cf. Tod, *Annals and Antiquities of Rajasthan*, V.II, p. 294.

[128] Bhargava , *Rise of the Kachhwahas in Dhundhar* , *Op.cit,* p. 67.

[129] Bhatnagar, *Life and Times of Sawai Jai SinghII, Op.cit,* p.16; cf. *Vir-Vinod,* V.II, pp.1297-98.

[130] Bhargava, *Rise of the Kachhwahas in Dhundhar*; *Op.cit;* cf. Shyamaldas, *Vir Vinod,* p.1298.

[131] Cf. Sarkar, *A History of Jaipur*, pp. 157-58.

[132] Bhargava, *Rise of the Kachhwahas in Dhundhar* , *Op.cit.* p. 68; Shyamaldas *Vir Vinod, Op.cit.*

During the war-of-succession that followed the death of Aurengzeb in 1707 A.D, Jai Singh initially supported Prince Azam's cause. Azam made Jai Singh the Governor of Malwa and increased his mansab. Later, in the final decisive battle for the crown between Azam and his brothers Muazzam at Jajau, near Agra, on 8 June 1707, Jai Singh changed his loyalties to Muazzam who came out victorious in the war of succession[134].

Muazzam's accession as Emperor Bahadur Shah-I, who ruled from 1707-1712 A.D, marked a period of disfavour for Jai Singh. He was ousted from his seat at Amber, and control of Amber was handed over to Bijay Singh, his younger brother, who had supported prince Muazzam in the war-of-succession. At the same time an Imperial garrison was established at Amber[135] and the Emperor changed its name as Mominabad[136]. Jai Singh now had to resort to all diplomatic skills as well as his sword in dealing with the situation. Matters were arranged so that Jai Singh could personally meat the Emperor at Ajmer and urge him to return Jai Singh's confiscated *watan jagir*. At Bahadur Shah's command, Jai Singh joined the Imperial Camp moving south ward to deal with the Mughal prince Kambaksh. Jai Singh soon realised that despite his attempts at arriving at conciliation, Bahadur Shah was in no hurry to return Amber to him. Thereupon, both he and Marwar's Ajit Singh surreptitiously left the Emperor's Camp on 30 April,1708, and accepted the hospitality of Rana Amar Singh II of Mewar at Udaipur, in May 1708[137].

Bahadur Shah's stern attitude towards Jai Singh and Ajit Singh not only brought them closer to each other, but Maharana Amar Singh of Mewar also rose to the occasion by forming a joint front of the Rajputs against the Mughal Emperor[138]. Sawai Jai Singh had studied very carefully the decadence of the Mughal power, the dissensions in the imperial family, and the general upsurge and discontent in the country. He therefore, decided to part with the Mughal Emperor at a convenient place and time[139]. Further more, the shrewd Jai Singh convinced his allies that the three states ought to strengthen their ties through matrimonial alliances. Consequently, Jai Singh married Maharana Amar Singh's daughter, princess Chandra Kunwar, and guaranteed that any son born to her would succeed to the throne of Amber, regardless of the natural rights of primogeniture favouring any of Jai Singh's older sons borne by any of his other queens[140]. Jai Singh had also forged a matrimonial alliance with Marwar, with the engagement (and a decade later, marriage), of Jai Singh with Princess Suraj Kunwar, the daughter of Ajit Singh of Marwar[141].

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[133] Jain, Shikha, *Princely Terrain.., Op.cit.*

[134] Jain, Shikha, *Princely* Terrain.., *Op.cit.* ; cf. Shyamaldas, *Vir Vinod, Op.cit.*

[135] Shyamaldas, *Vir Vinod* , *Op.cit.*, p.1298 ;cf. Sarkar, A History of Jaipur, p.161 ; also cf. Bhargava , *Rise of the Kachhwahas in Dhundhar*, p.72.

[136] Gupta, Mohanlal, *Darshniye Jaipur* (Hindi), Rajasthan Prakashan, Jaipur, 2000, p. 18.

[137] Cf. Jain, Shikha, *Princely Terrain, Op.cit.*

[138] Bhargava, *Rise of the Kachhwahas in Dhundhar, Op.cit*, p. 73.

There after the forces at the command of Mewar marched along side the contingent of Ajit Singh and Jai Singh towards Jodhpur. Their combined forces retook this capital from Imperial hands and in early July 1708, Ajit Singh was reinstated on his ancestral throne. The three armies of Mewar, Marwar and Dhoondhar then went on to ensure the return of Amber to Jai SinghII. Almost simultaneously, this 'triple alliance' defeated the Imperial army near the famous salt-lake town of Sambhar and occupied Sambhar in Oct.1708[142]. This battle was an important landmark both in the life of Sawai Jai Singh and the history of Rajasthan[143]. The results of the battle were far reaching: Firstly, Sawai Jai Singh was proclaimed as ruler of Amber at Sambhar, Secondly, Ajit Singh regained his rule over Didwana, Thirdly, Ajit Singh and Jai Singh agreed to enforce joint rule in Sambhar, and Finally, the sway of Rajputs was established at Hindaun, Bayana, Rewari and Rohtak[144].

The battle of Sambhar was responsible for change in Bahadur Shah's attitude towards Jai Singh and Ajit Singh[145]. The Emperor restored the mansab to both the Rajas on 6th Oct.1708. Restoration of their capitals (watan jagirs)[146] was subject to their withdrawal from Sambhar and Didwana and their accepting appointments to the provinces of Kabul and Gujarat. But the Rajas asked for the posts of Subedars of Malwa and Gujarat. So the question of final settlement with them lingered on till Oct.1711, when both of them arrived at the Mughal Court[147]. In mean time (May-June 1710), individual Imperial *Farmans* confirming them as rulers of their lands were issued[148].

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[139] Ibid, pp. 74-75.

[140] Jain, Shikha (ed.), *Princely Terrain*, *Op.cit.*

[141] Cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, p. 76.

[142] Jain, Shikha (ed.), *Princely Terrain*, *Op.cit.*

[143] Cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, p. 77.

[144] Ibid, pp. 78-79.

[145] Ibid, p. 79; cf. Jai, Sikha (ed.), *Princely Terrain*, *Op.cit*, p. 72.

[146] Cf. Sarkar, *A History of Jaipur*, p. 162.

After the death of Emperor Bahadur Shah-I in 1712 A.D, Jai Singh's position at the Mughal Court enhanced. The new Emperor Jahandar Shah's brief reign ended in Dec.1713 with his defeat at the hands of Farrukhsiyar. During this period a perceptible change took place in Sawai Jai Singh's relations with the Mughal Court[149]. At the instance of Asad Khan the *Jizya* (a toll tax) was abolished[150]. The pargana of Amber (Mominabad) which yielded an annual income of 3.3crores dams, besides Dewasa and Chatsu were granted in jagir to Jai Singh. His son Chimna was also granted Jagir of Bhogi (Phagi)[151]. During the reign of Emperor Farrukhsiyar (r.1713-1720) Jai Singh continued to hold a high position at the Imperial Court. However, as long as the Sayyid brothers, the Wazir (Prime Minister) Sayyid Abdullah Khan and the Bakshi Sayyid Hussain Ali who became the 'King-Makers'-were powerful at the Imperial Court, Jai Singh's contributions were marginalized by their influence. Despite their attempts at undermining Jai Singh, the Emperor conferred the Subedari of Malwa on Jai Singh in Oct.1713 and Faujdari of Mandsaur on his son Chimnaji[152].

Jai Singh's appointment as Subedar of Malwa coincided with the appointment of Balaji Vishwanath as the Peshwa (Nov.16, 1713)[153]. The incoming of Marathas was checked and in the absence of aid from the local Afghan and Hindu chiefs were subdued. These achievements earned honour and appreciation from the Emperor Farrukhsiyar[154]. Revolts of Afghans at Dhamoni were suppressed in March, 1715 but the revels could not be finally subdued because the Marathas with 30,000 troops had reached up to Ujjain after pillaging Dhar, Mandu, etc. Jai Singh reached Ujjain by May 1715. The Marathas took to flight. With a force of 10,000 Jai Singh, accompanied by Chhatrasal and Budh

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[147] Bhargava , *Rise of the Kachhwahas in Dhundhar, Op.cit.*

[148] Jain, Shikha (ed.), *Princely Terrain, Op.cit.*

[149] Bhargava, *Rise of the Kachhwahas in Dhundhar, Op.cit*, p. 87.

[150] *Akhbarat* (Jaipur), March 27, 1712, *Kapad-Dwara*, Jaipur; *ibid.*

[151] *Parvana* (Jaipur), No.62 (S. No. 43) & 260 (S. No. 53), *Kapad-Dwara*, Jaipur; it is corroborated by the *Arzdast* of Jagjiwandas; *ibid.*

[152] Jain, Shikha (ed.), *Princely Terrain, Op.cit*; cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, p. 88

[153] Bhargava, *Rise of the Kachhwahas in Dhundhar*, *Op.cit*, p. 91.

[154] *Farman* (Jaipur), No.40 (S. No.67), *Kapad-Dwara*, Jaipur.

Singh Hada, after pursuing defeated the Marathas who took shelter in the mountains of Pilsud[155]. It became possible only by tireless movement and prompt demonstration of force on Jai Singh's part. The Emperor praised him highly[156].

Jai Singh's prolonged absence from Malwa prompted the Marathas to resume their incursions into that province. In Oct.1717, at the advice of Sayyid Abdullah, the Emperor replaced Jai Singh as *Subedar* of Malwa and sent him away from the Imperial Court[157]. In Feb.1719, Farrukhsiyar was deposed in a palace intrigue, and was murdered shortly thereafter. The Imperial Mughal throne briefly went to Rafi-ud-Darazat (r. Feb-May 1719) and then to his brother, Rafi- ud-Daulah (r. May-Sept.1719), before Prince Roshan Akhtar became Emperor, and assumed the title 'Muhammad Shah' (r.1719-1748 A.D.). Ajit Singh at this point helped Jai Singh in partially re-gaining Imperial favour, and Jai Singh was given the title of the Faujdar of Sorath. The downfall and death of the Sayyids towards the end of 1720 saw Jai Singh's re-ascendancy at the Mughal Court[158].

Emperors who occupied the Mughal throne in quick succession following Bahadur Shah's death and with the rulers of the various Rajput states are examples of statesmanship, diplomacy, covert and overt negotiations, and strategizing. In addition, Jai Singh further strengthens his position by establishing cordial relations with the Marathas and the Bundelas[159].

With in a year of being called by Emperor Muhammad Shah had assigned Jai Singh the task to deal with the rising power of Jats under Churaman in 1721A.D[160]. Churaman's nephew, Badan Singh, was won over by Sawai, and in the face of a family feud, Churaman took his own life even as Jai Singh's forces reached Thun and encircled it. The stronghold of Thun was staunchly defended for a couple of months by Churaman's son, Mokham Singh, but won finally by Jai Singh's forces. The fort was thoroughly destroyed so that the site would never again be considered worthy for fort. Mokham sought Maharaja Ajit Singh's shelter at Marwar, while Badan Singh, now formally recognized as the chief of the Jats and granted the title of 'Braj-Raj, acknowledged Mughal suzerainty. In recognition of Jai Singh's role in securing the subordination of the Jats, the Emperor added the title of '*Raj Rajeshwar*' to those of '*Shri Rajadhiraj Maharaj Maharaja*' and '*Mirza Raja Sawai*' already held by Jai Singh[161].

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[155] Bhargava, Rise *of the Kachhwahas in Dhundhar*, *Op.cit*, p. 93.
[156] Sarkar, *A History of Jaipur*, *Op.cit*, p. 166.
[157] Jain, Shikha (ed.) *Princely Terrain*, *Op.cit*; cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, p. 94.
[158] Jain, Shikha (ed.), *Princely Terrain*, *Op.cit.*
[159] Ibid.
[160] Shyamaldas, *Vir Vinod*, V.II, *Op.cit*, pp. 1298-99.

Jai Singh spent the next seven years (1723-1729A.D.) in cultivating the arts and science for which he is popular and laying out a new capital city[162] in 1727A.D. on a scientific ground and named it as 'Jai Nagar' (Sawai Jaipur)[163]. It was a fully planned city unparallel in contemporary India. He built astronomical observatories at Delhi and Jaipur these were huge masonry structures in stone, unique in the contemporary world[164] (these are still in well preserved conditions). Later on three more observatories were also built by him at Benaras (Varanasi), Ujjain and Mathura[165]. When the Mughal Subedar of Malwa, Nizam-ul-Mulk was defeated by the Marathas, in the battle of Sakarkheda, the Emperor issued a Farman in the name of Sawai Jai Sigh granting Rs.50 lakhs for the expenses and other assistance to control the affairs in Malwa. Since Amin Khan was appointed Governor of Malwa, Jai Singh was apathetic to the Imperial interest, so he did not move from Amber[166].

In Oct.1729, Jai Singh was again appointed Subedar of Malwa for the second time, and held this office for about 10 months[167]. In Sept.1732, he was designated Subedar of Malwa for the third and final time in his career[168]. The appointment was an important one as the incessant Marathas raids into Malwa – a geographically crucial zone-now posed a greater danger to the Mughal Empire than they had before. In Dec.1729, with the military assistance from Mewar, Jai Singh engaged in battle with the attacking forces of Malhar Rao Holkar, Ranoji Scindia and other Maratha troops near Mandsaur. The Marathas proved stronger and obtained an indemnity of Rs.6 lakh, along with the promise that 28 parganas would be ceded to them in lieu of *Chauth*. The

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[161] Ibid, p. 1299; cf. Shikha Jain, *Princely Terrain*, pp. 72-73.

[162] Cf. Tod, Annals and Antiquities of Rajasthan, V.II, p. 289-91; Sarkar, *A History of Jaipur*, *Op.cit*, p. 172.

[163] Kaye, G.R., *A Guide to the Old Observatories At Delhi, Jaipur*, Calcutta, 1920, Rep.1985, Gurg., p.2.

[164] Ibid, pp. 61-68; Bhatnagar, *Life and Times of Sawai Jai Singh, Op.cit*, pp. 315-16.

[165] Kaye suggests that these observatories were built after early months of 1734 A.D., Kaye, *A Guide to the Old Observatories At Delhi, Jaipur, Op.cit.*, p. 6

[166] Bahura, G.N., *Catalogue of Historical Documents in Kapad Dwara, Jaipur*, Amber-Jaipur, 1988, p.ix

[167] Sarkar, A History of Jaipur, *Op.cit*, p.174; cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, p.96.

[168] Ibid, p. 178; cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, p.101 ; cf. Shyamaldas, *Vir Vinod*, p. 1299.

Maratha victory dealt a blow to the prestige of the Mughal Empire and the Rajasthani rulers[169].

During this period, Marathas inroads were taken place in Rajputana. Jai Singh and the Maharana of Mewar played a prominent role in the convening of a conference of Rajput rulers and chiefs in July, 1734 to find out ways and means to check the Marathas from coming beyond Narmada[170], which ultimately resulted in 'Hurda Pact'. This pact was not enforced adequately by all the concerned parties, Jai Singh's contribution to this conference and the pact re-confirmed his position of regional eminence[171].

The threat from the Marathas remained real, and in late 1734, the Mughal *Mir-Bakshi*, Khan-e-Dauran accompanied by Sawai Jai Singh, Marwar's Abhay Singh, and Kota's Durjansal, were sent to deal with the Marathas who came under Malahr Rao Holkar and Ranoji Sindhia. They clashed with Marathas at Rampura, but were defeated. Marathas encircled the Imperial army at Tonk-Toda, Jai Singh stood aloof at Jaipur. The Marathas advanced towards Kota, Bundi and Jaipur. Jai Singh represented Khan-i-Dauran to make peace but the latter considered it below his dignity. The Marathas went as far as Sambhar and looted immense wealth from them. Khan-i-Dauran suffered loses at Bundi also. At last Khan accepted Jai Singh's suggestions, and paid the Marathas Rs.22 lakhs as *Chauth* for Malwa, but it was not approved by the Emperor[172].

Now, Jai Singh decided to appease and support Baji Rao. He invited him to Jaipur and gave a warm welcome to his mother-Radha Bai, in June 1735, when she was going on pilgrimage to Varanasi. He attempted to secure an agreement between the Mughal Emperor and the Maratha Peshwa. The Peshwa was asked to submit an application for grant of the Subedari of Malwa and to assure that he would remain loyal to the throne. Baji Rao did all this accordingly. A *Farman* was issued on July 4, 1741 conferring the

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[169] Bhargava, *Rise of the Kachhwahas in Dhundhar Op.cit*, p. 104; cf. Jain, Shikha, *Princely Terrain.*, p.73

[170] Bahura, G.N., *Catalogue of Historical Documents in Kapad-Dwara, Jaipur, Op.cit,* p. x, (Cat. No.1497), pp. 181-82.

[171] Ibid; Shikha Jain (ed.), *Princely Terrain, Op.cit.*

[172] Bahura, G.N., *Catalogue of Historical Documents in KapadaDwara, Jaipur, Op.cit*; cf. Sarkar, *A History of Jaipur*, p. 181.

Naib-Subeari of Malwa on the Peshwa and *Subedari* in favour of Prince Ahmad Shah. It was agreed on both sides. Sawai's policy proved successful[173].

Jai Singh's position in the Mughal Court can be further proved with the confirmation of *Subedari* of Agra to him. By this time his political position at the Imperial Court, his influence with the Marathas, his standing with the king of Mewar, and his involvement in the affairs of the neighboring kingdoms of Bundi, Bikaner, Marwar and Kota, had made his position unchallengeable. So too had the military defeats he inflicted on many of the above, including Prince Bakhat Singh, the ruler of Nagaur and the brother of the Marwar Maharaja, who was beaten in the battle of Gagrana[174].

Jai Singh made the kingdom of Dhoondhar one of the largest tributary states of the Mughal Empire. With an area about 32,000 sq. km. Sawai's kingdom was far bigger than the 5,000 sq. km. that he had inherited at the time of his accession to the throne of Amber[175]. Modern researches confirms that Jaipur acquired its position as a major state of Rajputana in the first half of the 18th century as a cumulative result of the position enjoyed by its rulers in the service of the Mughal Emperors. The expansion of the territorial jurisdiction of the rulers did not take place essentially as a result of military conquests but mainly due to the transfer of various parganas in course of time by the Mughal authorities to the Jaipur rulers[176]. For the most part the state enjoyed peace and prosperity.

Besides the foundation of the Jaipur City, Sawai Jai Singh was also responsible for the building of numerous temples, forts and caravan serais. Among these were the Jaigarh fort, Raghunathgarh, Ambagarh, Nahargarh and a Sun-temple at the pilgrimage-site of Galta, near Jaipur City. Caravan serais for travelers were built not only in his territories, but also in other provinces, as an act of charity[177]. In 1741A.D, he performed *Ashvamedha-Yagna* or the horse sacrifice, a Vedic Ceremony which was performed by a small number of powerful monarchs of the early historical period, which had fallen into disuse over time[178]. In his life time, Jai Singh made the Jaipur City as a renowned centre of learning both secular and religious. Jaipur gained prosperity quickly after its foundation and has remained more or less a prosperous place since then. In order to rectify variations in the existing calendars, he compiled a famous set of astronomical tables known as '*Zij-i-Jadid Muhammad Shahi*' on the basis of astronomical observations taken at different observatories. He got translated many Persian, Arabic and European works on mathematics and astronomy brought by his delegates. He maintained his Royal Library (*Pothikhana*) which contained books on different subjects. He died on 21 September, 1743 A.D. leaving behind a strong State and a reputation of a statesman, scholar, mathematician, town planner, legislator, social reformer and above all an observational astronomer.

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[173] Bahura, *ibid,* P. xi

[174] Cf. Shikha Jain, *Princely Terrain*, p. 74.

[175] Ibid. p.76, Out of these territories, some was acquired as '*ijara*' or Mughal State-granted sub-lease holdings.

[176] Gupta, S.P., *The Agrarian System of Eastern Rajasthan*, Delhi, 1986, p.17; "the rulers of Jaipur State began to take ijaras from the time of Sawai Jai Singh. His sons also followed this practice, but they were prudent enough to take ijara of such mahals, Tahsils and parganas as were adjoining their vatan lands"; cf. Bahura, *Catalogue of Historical Documents in Kapad-Dwara, Jaipur*, p. iii.

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[177] Jain, Shikha (ed.), *Princely Terrain*, *Op.cit.*

[178] Cf. Bhargava, *Rise of the Kachhwahas in Dhundhar*, pp. 202-203; Shikha Jain, ***Princely Terrain***, *op.cit.*

CHAPTER SECOND

FOUNDATION AND PLANNING OF THE JAIPUR CITY

(A) FOUNDATION OF THE CITY

Sawai Jai Singh laid the foundation of his new Capital City in 1727A.D. and named it as 'Sawai Jaipur'. It was also known as 'Sawai Jainagar' which later on became popular as 'Jaipur'[1]. With the foundation of Jaipur, and eventual transfer of Capital of the *Kachhwahas* from Amber[2], the City rose to eminence that has led it to become one of the best known cities of the contemporary world.

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[1] The official name of the city when it was founded was 'Sawai Jaipur'. It is mentioned as 'Sawai Jaipur' in all the contemporary documents e.g. , the deed (1728 A.D) granting rent free land to the chief priest Jagannathan Samrat, who performed the ceremonies connected with the laying of the foundation stone of the City (Jaipur Archives Records No.101, *Kapad-Dwara*, Jaipur; Cf. Jadunath Sarkar, *A History of Jaipur City*, p. 205); the invitation letter (1729 A.D) given by Jai Singh to a trader Ghasiram Murlidhar to come and settle down in the newly built City of Jaipur and promising him many concessions for this act (this letter is also quoted in A.K. Roy's *History of the Jaipur City*, p.51); the *Parwana* (1733 A.D) recognizing the City as the new Capital of the Raja Sawai Jai Singh (G.N. Bahura and Chandramany Singh, *Catalogue of Historical Documents in Kapad Dwara, Jaipur*, Part-I, Jaipur, 1988, S. No.641, p.639); Girdhar's *Bhojnasar* composed twelve years after foundation of the Jaipur City, *Doha* or Verse Nos.182 & 189 (the relevant portions of *Bhojnasar* along with the translation were published by P.K. Gode in his article "Two contemporary Tributes to Minister Vidyadhara, the Bengali Architect of Jaipur at the court of Sawai Jai Singh of Amber (A.D. 1699-1743)" in *Dr. C.K. Raja Presentation Volume*, Madras, 1946, pp. 285-294)- all mention the name 'Sawai Jaipur'. Bahura suggests that the idea of founding a new bigger City to the South of Amber came to Jai Singh's mind to commemorate the victory or *Jaya* at the battle of Sambhar in 1708 AD. Thus, he gave it the name of Jayapur, the City of Victory, but it took some time to plan and manage for adequate resources and competent planners to carry it out successfully according to his wishes and it took more than fifteen years to finalize the total plan of the City, G.N. Bahura & C. Singh, *Kachhwahas of Amber-The City of Mother Goddess*, Jaipur, 2009, p.16.

The City was also called 'Jainagar'. Bakhatram Saha who generally calls the City 'Sawai Jaipur' in *Buddhivilasa* (1770 A.D), also mentions 'Jainagar' (*Buddhivilas* was published by Rajasthan Oriental Research Institute, Jodhpur, 1964; cf. A.K. Roy, *History of the Jaipur City*). Ramanarayan (*Rasarasi*), a poet in the court of Sawai Pratap Singh, mentions in his book *Sansar-Sara-Vachanika* the City as 'Sawai Jainagar' (Winesh Shastri, *Maha Kavi Rasarasi*, Jaipur, 1972, p.147); Kavi Shyamaldas, *Vir Vinod*, Vol. II, p. 1262, 1299. Later on the name of the City Sawai Jaipur was shortened into 'Jaipur' in the popular mouth (J.N. Sarkar, *A History of Jaipur*, *Op.cit.*). Foreign writers have never used the title 'Sawai' for the town. *The Imperial Gazetteer* (1908) gives the account of the City under the title 'Jaipur City' (or Jainagar). James Tod also calls the City as 'Jeipoor' or 'Jeinuggur', in his own words (cf. Todd's *Annals*, Vol. II, p. 289) as:

> "He (Sawai Jai Singh) was the founder of the new Capital, named after him Jeipoor or Jeinuggur which became the seat of science and art, and eclipsed the more ancient Amber, with which the fortifications of the modern city unite, although, the extremity of the one is six miles from the other".

[2] Cf. Kavi Shyamaldas, *Vir Vinod*, Vol. II, p.1262; J. Sarkar, *A History of Jaipur City*, *Op.cit*, p. 209.

I

The establishment of a new Capital City could be justified by two plausible factors – the political dominance which the State of Amber had already acquired in erstwhile Rajputana under the patronage of the Mughal rulers, and the need for an environment that would be suitable as the new Capital of the State. Amber had served as the Capital of *Dhoondhar* for about six centuries and the *Kachhwahas* had gained considerable significance during the Mughal period. Though, by the beginning of 18th Century Amber had expanded, having narrow streets[3] it had become very congested. There was not much scope for further expansion on the existing hilly terrain. To cater the needs of the grown up State, Sawai Jai Singh chose to build an entirely new city[4], devoid of the shortcomings of the Amber as a Capital City. The influence of Amber State extended up to Bundi in the south and this provided the south side of Amber with sufficient security for Sawai Jai Singh to affect the shift of his Capital from Amber to a new site in the vast plains[5] to the south of hills of Amber. The historic Agra-Ajmer highway emerging from the *Purana-Ghat* or *Ghat-Ki-Guni* acted as the southern edge of the walled town of Jaipur.

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[3] Father Jose Taeffer Thaler, who was a friend of Father Andra Strobl and visited India in 1734 A.D, mentions,

> "The wide and long streets" of Jaipur which were contrast to "the unequal and narrow streets" of other towns.

[4] Girdhari's *Bhojnasa* (*Doha* nos. 182 and 187) reads as :

> "Sawai laid the foundation of Jaipur, he laid out many streets, and thus enhanced the joy of heart. He said to Vidyadhara that a City should be founded here."
> "It should be populated in one year and should be twelve *kosas* (1 *kos* ~ 2 miles) in extent. Merchants from different places should be called to stay here".

Jai Singh instruct Vidyadhar, an architect and engineer at his Court, to built the new City according to his wishes, as Girdhari (*ibid, Doha* nos.189, 190 & 192) mentions:

> "I (Jai Singh) have got immense treasure. Take what you (Vidyadhar) want and use it. Sawai Jaipur should be made a unique City". He blessed him and said, "It will be done soon (it will soon be populated). It was the year 1784 VS (1727AD) listen to this attentively", "the whole world will be afraid of this but this will not be afraid of any thing".

[5] As Reginald Heber, in his famous memoirs *Narrative of a Journey through the Upper Provinces of India, From Calcutta to Bombay, 1824-25* (Vol. II, London, 1828) mentions about the City's defense:

> "The wall (of the city) is high, with dentellated battlements and lofty towers, extremely picturesque, but with no pretensions to strength, having neither ditch nor glacis. Its security must, of course, depend on the forts by which the summits of the surrounding hills are crowned. But though these might ruin it and prevent an enemy from occupying it when taken, they could not save it against a spirited and well directed attack from the plain".

The foundation of Jaipur was too an outcome of new economic dimensions. The earlier Capitals of *Kachhwahas* i.e. Dausa and Amber contain remains of second outer wall surrounding the fields beyond the city walls including the agricultural land, thus indicating the agrarian base of the society. There was a significant economic shift from an agriculture base to trading when the Capital was shifted from Dausa and Amber to Jaipur[6]. The principal businesses of Jaipur City were banking and trade in jewellery, grains, cotton and stone. The City grew quickly and, for coming two centuries, was a leading centre of banking and transactions of *hundis*[7].

II

The foundation of Jaipur was not spontaneous but it was a planned one and constructed in many successive stages as proved by the contemporary documents[8] and some old maps and plans prepared for planning the City and its environs, out of which many survive still today[9]. The Maharaja had collected many prints, maps and printed literature from all over the world and after consulting and discussing with his associates and architects he planned his City[10]. The position for the new Capital was so located as to connect it with the Amber fort by the hill range of 'Kali-Khoh', at the apex of whose Sawai Jai Singh built Sudarshangarh (Nahargarh Fort) which commanded his new Capital[11]. A contemporary record of Jaipur proves that Jaipur was planned to be built between Averi and Sanganer[12].

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[6] Jai Singh has clearly shown his intention to led the foundation of his new City of Jaipur and to make it a commercial centre by establishing thousands of *hats* or the shops and markets on the main roads of the City, as mentioned by Girdhari in his *Bhojnasar* (*Op.cit*, *Doha* no.196):

> "There are many cross-roads with shops on them and thousands of markets (*hats*) where merchants of different countries are plying there trades".

[7] Girdhari (*Bhojnasar*, *Doha* no.199) mentions about the big transaction of *hundis* or the 'Bill of Exchange' which was taking place in the Jaipur City. It reads,

> "In this way the merchants of many places have come there. Hundis of lacs and crores are current here"

The prosperity of Jaipur continued almost up to the end of the 18th century in spite of the frequent inroads of the Marathas. All the battles with the Marathas were fought well outside the state capital, and the country side also escaped general devastation up to the end of the century, cf. A.K. Roy, *History of the Jaipur City*, p.63.

[8] Such as *Siyah-Hazur* Papers related to the town visits of Sawai Jai Singh from V.S.1790/1733AD onward, and *Siyah Imarat* documents related with the building constructions in the City and which are available from V.S.1790/1733 A.D.

[9] Old City Map Nos. LS/14 and LS/17 preserved in the City Palace Museum, Jaipur; and a large number of relevant maps and plans listed in G.N. Bahura,'s *Kapad-Dwar Catalogue*, Vol. II , *Op.cit.*

The planners of the Jaipur City kept the palace and garden at 'Jainiwas' as its centre[13], which had already been established before founding the City. As far as the date of completion of Jainiwas is concerned, a contemporary Rajasthani source of

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[10] Bahura, G.N. and Chandramany Singh, *Catalogue of Historical Documents in Kapad-Dwara, Jaipur,* Part II- *Maps and Plans*, Jaipur, 1990, p. 10; Jai Singh had taken some time to plan and manage for adequate resources and competent planners to carry it out successfully according to his wishes and it took more than fifteen years to finalize the total plan of the City. In preparing the plan, Jai Singh introduced his own ideas also to shape his dream city which were based on his mathematical and astronomical knowledge acquired through different means. Special attention was given to accurate measurements, rhythmic structures, ventilation, open space, uniform major roads through straight streets providing all facilities to the public. There are several original plans preserved in the City Palace Museum, Jaipur, which were prepared by the master architect and his associates, submitted to the Maharaja for his instructions and approval. Thus, when all the plans were approved, the foundation of the new City was laid on 18th Oct.1727 in the north-eastern point under the priestly supervision of Pandit Jagannath Samrat for which eight *bighas* of land was granted to him in village Bhojpura in the south-west of the proposed City, Bahura, *The Kachhwahas of Amber*, *Op.cit*, p.18.

[11] Cf. Tod, James, *Annals and Antiquities of Rajasthan*, V.II, p.297.

[12] *Parwana* (Jaipur), *Mawazana Kalan, Margh Sudi* 9, V.S.1784/1727 AD, Jaipur Records, Rajasthan State Archives (R.S.A.), Bikaner.

[13] Regarding the construction of the City Girdhari's *Bhojnasar* (*Doha* no. 183) mentions that Jai Singh instructed his officials that the Jainiwas should come with in the City:

"Jainiwass yaa sahar madhi aavai yahai vichaari,
Chaupri keru bazaar bahu dhari pichhwaarai saari"

[The new City should be so constructed that Jainiwas should come with in the city, this is my wish. There should be many cross-roads with shops on them. The back-yards of the houses should meet together.]

Girdhari (*Bhojnasar Doha* no. 184) describes the Jainiwas:

"Mukat mahal Raajaahi mahal Baadal mahal sujaani,
Sidraa aur hamaam suni burji rasoi thaani"

[There were Mukatmahal, Badalmahal, three doored *verandas*, bath-rooms and kitchens in that palace.], and (*ibid*, *Doha* no.185)

"badi badi naharain jahaan haud tadaagahi dekhi,
Bhar fanhri nalin tai kundaa chaadri pekhi"

[Big canals were running, there were many reservoirs of water and tanks and the water falling from the fountains spread like sheets.]

V.S.1768/1711 A.D. shows that the completion of the Jainiwas Palace in that year[14], and it is also mentioned that after its completion *Daroga* Mahan Das, the in charge of Jainiwas, was awarded[15]. The buildings of the City and its surrounding walls and gates were started with official ceremony on *Posha Sudi* 1, V.S.1784./18th November (Saturday), 1727 A.D.[16] The priest Jagannath Samrat, who performed the ceremonies

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[14] *Siyah-Vaqaya* (Jaipur), *Chait Vadi* 6, V.S.1768/1711 AD, Jaipur Records, R.S.A., Bikaner; Scholars have different opinions regarding the date of completion of the Jainiwas. G.N. Bahura mentions, "In the year 1713, Sawai Jai Singh performed *Pundarik Yagna* and developed the 'Jainiwas Garden'. A number of plans (Nos. 112, 211 in the present collection) were prepared for it and special care was taken for the canals meant to water the trees and plants". It may have been during this period that Jai Singh also thought of moving the idol of the *Kachhwaha* deity 'Govind Deva' from Kanak Vrindavan to Jainiwas and of planning the City (Jaipur) around it. V.S. Bhatnagar suggests that Jai Singh installed the image of *Govida Deo* at Jainiwas in 1715 A.D. Jadunath Sarkar suggests, "In 1725, he (Jai Singh) was busy erecting his Astronomical Observatory in the Jaisinghpura suburb west of Shah Jahan's City [Delhi]. He now issued orders to his officers in Amber to build a palace (Jainiwas) on the site of his future Capital, on the plain below, according to the plans sent." According to a list, compiled by the staff of the Jaipur City-Palace, after the integration of the Rajasthan State, in 1949 AD, Jainiwas was completed in 1726 AD, "List of Famous Temples and buildings, etc. constructed by the Maharajas and Maharanis of Jaipur", cf. A.K. Roy, *History of the Jaipur City*, Appendix.-VI. Thus, it is confirmed from the above references that Jainiwas was built much before the foundation of the City. For details see, Bahura, *Catalogue of Historical Document in Kapad-Dwara, Jaipur*, Vol. II- *Maps and Plans,* Jaipur, 1990, p. 9; Bhatnagar, *Life and Times of Sawai Jai Singh,* f. n. 57, 332; Sarkar, *A History of Jaipur City*, p. 205;.cf A.K. Roy, *History of the Jaipur City*, p. 44.

[15] *Siyah-Vaqaya* (Jaipur), *Shravan Vadi* 13, V.S.1768/1711 AD, Jaipur Records, R.S.A., Bikaner.

[16] G.N. Bahura, *Literary Heritage of the Rulers of Amber and Jaipur*, Jaipur, 1976, pp.109-110; cf. Sarkar, *A History of Jaipur City*, p. 205; also cf. V.S. Bhatnagar, *Life and Times of Sawai Jai Singh, ibid;* But A.K. Roy, on the basis of *Buddhivilas* suggests that the date of the foundation ceremony was *Pusa Badi* 1, 1784 V.S./29 November, 1727 A.D, cf. A.K. Roy, *History of the Jaipur City*, p. 44; In the words of James Tod (*Annals and Antiquities of Rajasthan*, *Op.cit*, Vol.II, pp.296-297),

"It was in S.1784 that he (Sawai Jai Singh) laid the foundation of 'Jeipoor'. Raja Mull was the *Mosaheb*, Kirparam the stationary *Vakeel* at Delhi, and Boodh Singh Khombani, with the cordo, or royal camp, in the Dekhan: all eminent men"

Girdhari's *Bhojnasar* (*Doha* nos. 190 & 191) clearly mentions about the date of the foundation ceremony:

"kari asees vintee karee deho beg basaaye,
Samvat satrese sunee chauraasi manulaaye"

[He blessed him and said, "It will be done soon (i.e. the city will soon be populated). It was the year 1784/1727 A.D. Listen to this attentively.]

"Pos-hi Sudi parivaajhaa baarsani sarvaraa,
Girdhaari yaa sahar ko janam mahaasubhvar"

[It was *Posh Sudi* 1 and the day was Saturday, when the foundation of this City was laid at a very auspicious moment.];
The 'foundation date' of the Jaipur City, i.e. *Posh Sudi* 1, V.S.1784/ 18th Nov. 1727 AD, is also verified by another contemporary document (receipt S. No.101) preserved at the Rajasthan State

connected with the laying of the foundation stone of the City, was granted eight *bighas* of rent free land in a nearby village[17].

According to the Jaipur Tehsil Records, the site of the Jaipur City covered parts of six villages, namely- Nahargarh, Talkatora, Santosh-Sagar, Moti-Katla, Galtaji and Kishanpol[18]. Some maps in the *Kapad-Dwara* Collection mention names of places like Minawalawas, Bhawani-Shankarpura, Bhojpurya, Jainiwas, Kalonari and Harasrampura, which existed below the Amber valley in the Jaipur area[19]. Jaipur Records of V.S.1784/1727A.D. convey that compensation was given to the shifted villagers who were settled in the area acquired by the state for the construction of the new Capital City[20]. Before starting the construction of the Jaipur City, the selected area was leveled up by removing unwanted soils and shrubs, sand dunes and gullies as it came out from Girdhari's *Bhojanasar* which cited the order of Jai Singh to this effect[21]. Jaipur Records also mention that when the construction work at the site of Jaipur started, a village near Amber was given to a Brahman named Sami Dutt Dixit in lieu of his ceremonial work (*sankalp*)[22], and Sahab Ram was appointed in-charge of the material collection and its transportation for the building constructions in the City[23].

Archives, Bikaner, cf. G.N. Bahura (ed.), *Sawai Jai Singh Charit,* City Palace, Jaipur, 1979, f. n.153, pp.105-106.

[17] Bakhatram Saha's *Buddhivilas* (*Op.cit,* ff. 8-9) mentions that the priest in charge of the foundation ceremony, Pandit Jagannath Samrat was awarded some land near 'Hathroi' on the out skirts of Jaipur, and in all Rs. 1083.5/ were spent in the ceremony; cf. A.K. Roy, *History of the Jaipur City, Op.cit,* p. 44; Sarkar, J.N, *A History of Jaipur City*, p.205

[18] Cf. Roy, A.K., *History of the Jaipur City*, p. 45.

[19] *Kapad-Dwara Catalogue, Part.II- Maps and Plans,* Map No. 112 (plan of a canal for the Jainiwas Garden at Jaipur), p.80; Sumbul Halim Khan, on the basis of an *Arhsatta* document of V.S.1786/1729AD of the *Pargana* Sawai Jaipur preserved at the Rajasthan State Archives, suggests that at the time of its foundation, Jaipur included the area covered under Tappa Haveli, Khoh, Kakarh, Ramgarh and Hastera; cf. Sumbul Halim Khan, "Planning the Pink City: Maps and Plans" *Indica-* 35 (1998, The Heras Institute St. Xavier's College Mumbai)

[20] *Chitthi* (Jaipur), *Posh Sudi* 1.V.S.1784/1727AD, Jaipur Records, R.S.A., Bikaner.

[21] Girdhari's *Bhojnasar*, which was written after twelve years of Jaipur's foundation, mentions that Jai Singh ordered (*Bhojnasar*, *Op.cit, Doha* no.188) :

"*kuche teeve ret naale bahut haipur,*
tin kau durikaraaye kai karo haveli sur"

[There are shrubs, sand-dunes, gullies all over. These should be leveled up and then the *Haveli*'s should be constructed].

[22] *Dol* (*Siyah-Hazuri* Jaipur), *Posh Sudi* 1, V.S.1784/1727 AD, R.S.A., Bikaner.

[23] *Chitthi* (Jaipur), *Posh Sudi* 1, V.S.1784/1727 AD, R.S.A., Bikaner.

Some structures belonging to nobility and government servants had also been constructed at this site even before the official foundation of the City[24]. At the time when Jaipur was formally founded, three structures *Chandra-Mahal, Govinda-Mahal* or *Surya-Mahal, Badal-Mahal* and *Talab*, the water lake within the Palace Complex which later on came to be known as 'Talkatora', were already completed. The list of the Palace Maps mentioned in the *Kapad-Dwara Catalogue*[25] includes the construction plans of *Chandra-Mahal*, *Sarvatobhadra* (*Diwan-i-Khas*), *Moti-Mahal* and a portion of *Zenana-Chowk* made during the time of Sawai Jai Singh[26]. A detailed map[27] of the Jainiwas Garden gives the names of the blocks from *Badal-Mahal* to *Chandra-Mahal* including the width and length of each block in yards. It also mentions adjoining structures such as *Kothi-Badwali, Kothi-Khajano, Kothi-Sibla, Zenanai-Deodhi, Matiba-Mahal,* etc. A detailed analysis of the actual map provides useful information about the initial construction of Jainiwas. Yet another map (No.231) mentions that the *Zenana-Chowk* of *Chandra-Mahal* was designed with 15 courts before the Jaipur City was inhabited[28].

Almost simultaneously with the foundation of the Jaipur City, the work was started on a canal to bring water from the Jhotwara River to the new city[29], then under construction[30]. The preliminary proposal about the project of this canal construction was submitted in July 1726[31]. Shortly afterwards Jai Singh commissioned his palace (Jainiwas), other royal buildings and the astronomical observatory[32] ('*Jantar-Mantar*') a large sector in it[33]. The Palace, Govinda-Deva Temple[34], and at a lower level the Badal-Mahal, which was built on the southern bank of the Talkatora, all were enclosed within high wall. The observatory also became a part of the enclosed complex.

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[24] Although, the date on Map L S / 14 is not clear, the year corresponding to A.D. 1725 is mentioned on it .if this date has been correctly put, it would appear that Jai Singh started the construction of his city in that year but the official foundation ceremony was performed later, A.K. Roy, *Ibid*, pp.40, 45

[25] Map no. 166, *Kapad-Dwara*, City Palace, Jaipur.

[26] Bahura, G.N., *Catalogue of Historical Documents at Kapa-Dwara, Jaipur*, Vol.II, *Maps and Plans*, Jaipur, 1990, Map. No.166, dated early 18th Century.

[27] Map No. 276, *Kapad-Dwara Catalogue, Op.cit.*

[28] Ibid, p.118.

[29] Sharma, G.S., *Sources on Social and Economic History of Rajasthan* (17th – 20th C.), Bikaner, 2005, p.196.

[30] As the construction was going on when the foundation of Jaipur was laid in 1727 AD.

[31] *Arzdast*, Anand Ram to Jai Singh, *Shravan Vadi* 13, S.1783/July 16, 1726 AD, Jaipur Records, it informed that a canal from Bandi River, about 9 *kos*/18 miles from Jainiwas, would prove a more difficult and costly and undertaking that one from the Jhotwara River, which was about two *kos*/4 miles from the Palace, and intervening sand dunes were also not very high; cf. V.S. Bhatnagar, *Life and Times of Sawai Jai Singh*, f. n. 55, p. 331.

[32] The foundation date of the observatory is not mentioned clearly. It has been indirectly derived and speculated by some scholars. A.K. Roy mentions that there are seven *slokas* inscribed on the southern side of the *Nandivalaya-Yantra*, at the Jaipur Observatory. The sloka "Yasminnahri Chaturshu......" constitute a problem in algebra. If we solve this problem we get the *Saka* 1630 corresponds to1718

During the period of Sawai Jai Singh eight gateways were built in the walled City of Jaipur and which are still extant. These gates are *Surajpol* in the east, *Chandpol* in the west, *Shivpol* or Sanganeri Gate on the north-south axis on the southern end with two other gates i.e. *Kishanpol* or Ajmeri Gate and *Rampol* or the Ghat-Darwaza also in the southern city wall, in the north *Dhruvpol* or the Zorawar Singh Gate and in the north-east, the *Gangapol*. The eighth gate *Brahma pole* is now known as 'Samrat Gate', the gateway to the Brahmpuri colony which exists in the north of the City. Three other existing gates are the 'New gate' which looked like a postern (*Chor-Darwaza*), and was later increased in size by Sawai Ram Singh-II (1835-1880 A.D.)[35], the *Char-Darwaza* which was a four sided gate built on north-eastern end, and the *Man pole* in the south-western end. The peripheral demarcation of the City i.e. the town walls were guided by the location of these gates.

A.D. The full *sloka* is given in *Utpattindu Shekhar* by Durga Prasad Duved (Jaipur, 1936, pp. 65-66); cf. A.K. Roy, *History of the Jaipur City*, f. n. 28, p.45. But the above date is conjectured, as the available oldest City Map No. L.S./14 dated V.S.1782/1725 does not show the observatory building or the construction of any instruments therein. Thus it appears that the Jaipur Observatory was started to built-d somewhere during 1725-26 A.D.

[33] *Siaha Hazur* (Jaipur), V.S.1783/1726 AD, Jaipur Records, R.S.A., Bikaner.

[34] The temple dedicated to Govinda-Deva, is situated about midway between the *Chandra Mahal* (the Moon Palace) and *Badal Mahal* (the Cloud Palace). It is one of the most venerated shrines in Jaipur. Jai Singh installed the image of *Govinda Deo* at Jainiwas in 1715 A.D. and the construction of the *Barahdaris* for the present temple was also started in the same year, Bhatnagar, *Life and Times of Sawai Jai Singh*, , f .n. 57, p.332; cf. Shikha Jain (ed.), *Princely Terrain*, *Op.cit*, pp. 108-109.

[35] He attempted to modernize the city both physically and culturally in both these matters he wanted to be a worthy successor of his great ancestor Sawai Jai Singh. In so far the material improvement of Jaipur was concerned Ram Singh succeeded to a great extent. He got a modern water works constructed, established a gas works for lighting the city roads, roads were paved in his time, built hospitals, schools, colleges, museums, the Public Library Building (started in 1876 and completed in 1881 A.D), the Ram Niwas garden (1868 A.D) and the Museum building in this garden (1876-87 A.D), and the Mayo Hospital building (1870- 75) on the eastern side of garden. It is worth noticing that except for the Public Library all the other three were out side the city wall. The main features of the city with in the walls remain the same today as they were when Ram Singh died in 1880 A.D. Substantial changes have occurred only in the *Chaura-Rasta* which did not have many building in those days. The open spaces have been filled up by new buildings often not in keeping with the architectural style of the city and a gate was opened towards the south facing the *Ramniwas* garden in the fourties of the last century. Originally the colour of the houses facing the main streets was white. But the Maharaja Ram Singh tried colouring all the streets differently, green, yellow, pink, etc. Finally pink colour was adopted for the whole city and since then the Jaipur City is being known as the 'Pink City', cf. A.K. Roy, *History of the Jaipur City*, pp. 78-80.

However, the Jaipur plans in the *Kapad-Dwara* section from the time of Sawai Jai Singh only mentions the name of the gates in the eastern, western and southern walls. *Dhruvpol* or the Zorawar Singh gate in the northern wall is not mentioned. The details from *Siyah-Hazur* about Jai Singh's town visit in 1733 A.D. also does not refer the gates existed in the northern wall of the City. But the *Siyah-Hazur* of V.S.1794/1737A.D. mentions 'Gangpol', name of a gate existed in the northern wall of the City[36] which shows that this gate was constructed in or before 1737 A.D.

Another published undated map of Jaipur[37] clearly shows the sub-division and structuring of the Jaipur City with eight gates[38] and also mentions the surrounding forts or gates such as Hathroi and Shankargarh or Moti-Doongri. The eight gates mentioned are *Surajpol, Chandpol, Dhruvpol, Rampol, Gangapol, Kishanpol* and *Brahmpol* respectively. At present, except for the *Brahma pole* all other gates can be found in the walled city. The entry to Brahmapuri is through the Samrat Gate and it is possible with all probabilities that this was the *Brahma pole* with Brahmapuri as part of the Jaipur walled city[39]. This map also mentions the two *Chowkries* or the sectors named Topkhana-Desh and Topkhana-Hazuri. It can be deduced that both the Topkhana-Desh and Topkhana-Hazuri were two ends of the City conceived at the same time by Sawai Jai

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[36] *Siyah-Hazur* (Jaipur), *Kartik Vadi* 4, V.S.1794/1737 AD, Jaipur Records, R.S.A., Bikaner.

[37] This concentric map is a partial transformation of an earlier revenue map of Jaipur. It shows the east on the top and the eight gateways of the Jaipur City as well as forts and towns in the eight directions with jaipur as the centre. Distances on the map are mentioned in *kos* and it is in *Dhoondhari* (Jaipuri dialect). Possibly it is a revenue map as mentioned by Gole, Susan, *Maps and Plans of India*, Delhi, 1989, p.53.

[38] The *Rajvallabha* also specifies the number of gates for any construction of a *Pura* (Fort). It mentions that there should be four Singh-dwar (literally 'lion gates') and eight strong gates of entry in the city wall, Pandey, Shailja (Trans.), *Rajvallabhamandanam* (Hindi trans.), Varanasi, 2001, p.45.

[39] *Rojnamch-Potedar* (Jaipur), V.S.1783/1726 AD, Jaipur Records, R.S.A., Bikaner; It shows the rectangular town planning of the Jaipur City and clearly mentions that the City was divided into a number of wards separately for different socio-economic classes, such as Brahmans, Rajputs, *Vaisyas*, *Jalahas* or the weavers, *Telis*, *Chipis* or the dyers, etc. and *Brahmapuri* was for the Brahmans and the scholars. Thus, it is clear from this document also that the Brahmapuri colony was a part of the City. The absence of the city wall between Brahmapuri and *Chowkri* Purani-Basti and the presence of Samrat Gate again indicate Brahmapuri as a part of the City, and the remains of the old city wall around Brahmapuri can still be observed on the road to Gaitor. Two important *havelis,* that of Rajguru Samrat Jagannath and the Rajpurohit Ratnakar Paundarik, were constructed in Brahmapuri before foundation of the Jaipur City. Other Brahmans who came from Banaras (Varanasi) and Prayag to perform the *Ashwamedh Yagna* in 1734 AD were also settled here. *Kapad-Dwara Catalogue*'s Maps Nos. 249 and 251 dated 1725-50 AD show that the work was being done in *Jagannath Sagar*, a water-body in Brahmapuri named after Jagannath,, and an another Map No.287 of the same period, shows the reservoir area from Talkatora in Jainiwas to Kanak-Bagh. And a number of canals were channelized through Brahmapuri and Jainiwas to supply water to the City.

Singh, even though the Topkhana-Hazuri was developed later due to the presence of sand dunes in the area.

After the completion of the Palace, basic layout-main roads, the surrounding wall (*Kot*) and gates, Sawai Jai Singh started the construction of the masonry shops with uniform shape and size in *bazaars* or the markets on the cardinal roads[40] and summoning traders, merchants or bankers, and artisans from Rajasthan and other places to settle and doing business in the City. Shops in the main markets- *Johri Bazar, Sireh-Deohri Bazar, Kishanpol Bazar* and *Gangori Bazar*, *havelis* and temples on the cardinal roads and streets were constructed by the State ensuring that a uniform façade of the street is maintained in the newly founded City of Jaipur.

The earlier construction plans of the City such as that seen in Map No. L.S. /14[41] preserved in the City Palace Museum show a kind of progress report of the work done in the initial stage of Jaipur construction. It specifically mentions the construction of shops on both sides of the earliest markets - Johri Market, Sireh Deorhi Market, Kishanpol Market, Chandpol Market and Gangori Market - including the number and size of the shops. It also shows initially Jaipur was enclosed from the southern and the western side by the city wall and three city gateways – Chandpol in the west, Kishanpol (Sanganeri Gate) and Shivpol (Ajmeri Gate) in the south – were built. This is the only available earlier construction map of Jaipur at present which suggests that the western sectors or *Chowkries* i.e. 'Purani-Basti', 'Topkhana-Desh', *Chowkri* combining the present blocks 'Visheshvarji' and 'Modikhana', and the Palatial Complex, as shown on this map came into existence first, where as the eastern sectors or *Chowkries* i.e. 'Topkhana-Hazuri' or 'Ghat-Darwaza', 'Ramchandraji' and 'Gangapol', are developed later on. But L S / 14 is only a part plan of the City as evident from similar part plans of the eastern sectors or *Chowkries* mentioned in the *Catalogue of Historical Documents in Kapaddwara, Jaipur, Part.II-Maps and Plans.*

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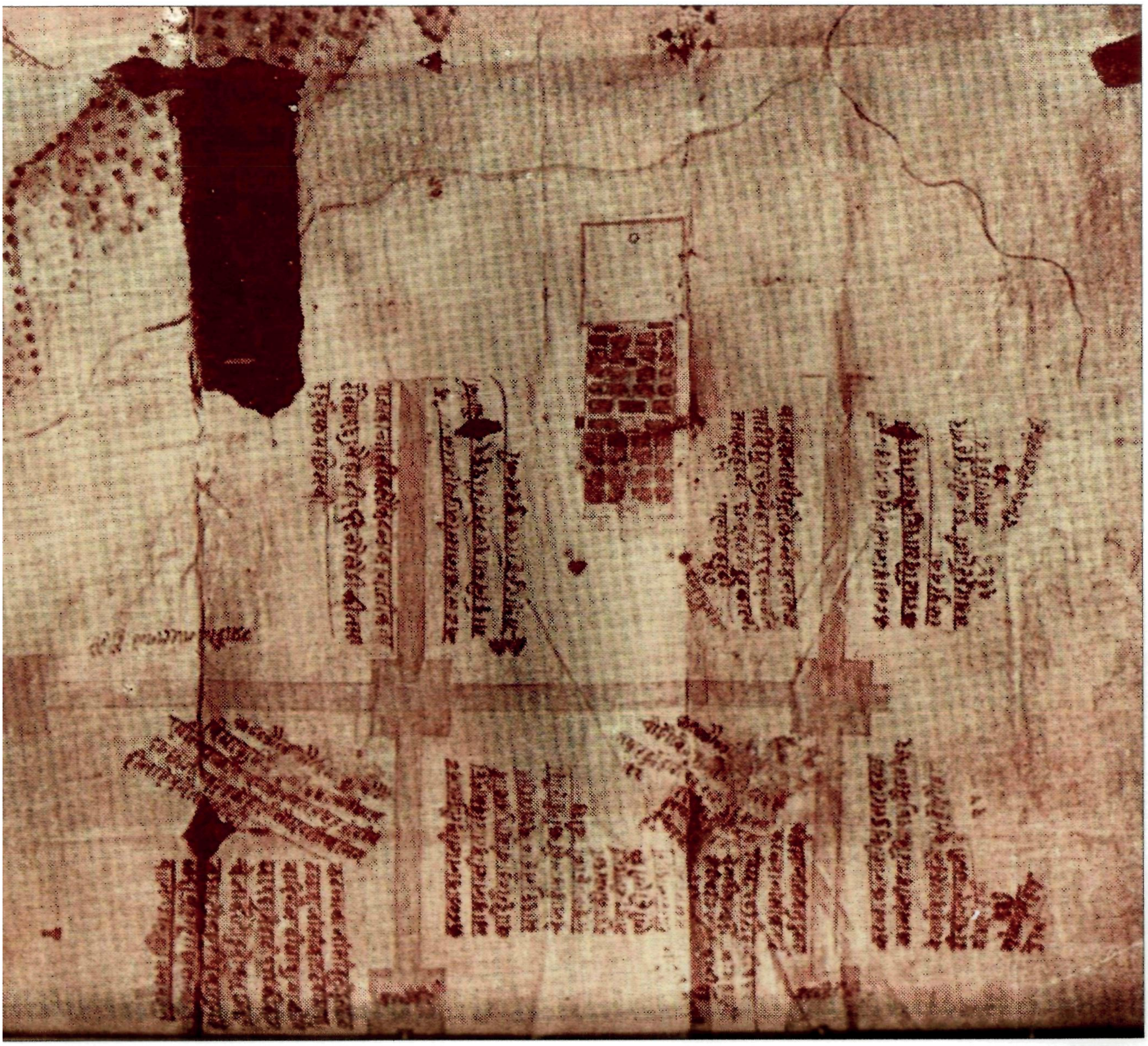
[40] *Parwana* (Jaipur), *Margsheersh Sudi* 9, V.S.1784/1727AD, Jaipur Records, R.S.A., Bikaner; Later on his son and successor Ishwari Singh ordered upper rooms to be built on these shops with stone lattices, cf. Sarkar, *A History of Jaipur*, p. 207..

[41] Though the exact date of this map is not clear, the year 1782 V.S., corresponding to A.D.1725 A.D. is mentioned on it.

PLATE – 1



Map No. L.S. / 14: Original Plan of the Jaipur City, V.S.1782 / 1725 A.D.

Again, the *Kapad-Dwara Catalogue* maps, listed as No. 249 and 251, show the work being done in Jagannath Sagar, a water body in Brahmapuri named after Jagannath Samrat, and at the *Ghat* near Paundarik-Haveli with a water-outlet for Jainiwas. Map No. 107[42] suggests the beautification of area between Brahmapuri and Amber with prominent gardens, such as, garden of Purohit Gangaram, Samratji, Sarkar, Naulakha-Bagh, Chandra-Bagh, Nand-Bagh, Vijay-Bagh and Man-Bagh, and Vyas-Kund (Tank), *Mia-Ki-Sarai*, and Jain temple by Jai Singh[43].

By 1729 A.D., a major part of the City, including the temples, markets, the huge mansions of the rich and the smaller houses of the common men were ready, as Jai Singh's frequent visits to the town referred in the contemporary sources. Though embellishment of buildings took a lot of time, for example, a source dated V.S.1789/1732A.D. mentions about some decoration works completed in the buildings of Moti-Dungri and other places in the Jaipur City[44]. Some of the *Siyah-Hazur* Papers, concerning Jai Singh's visits[45], give an idea of the period of the completion of some structures in the town. The document mentions gates, *Chowks*, temples and markets such as *Suraj pole, Chandpol, Shivpol* (*Ghat-Darwaza*), *Ram pole* (Sanganeri Gate), Chandni-Chowk, Pahad-Ganj, Ram-Ganj, Brahmapuri[46], Thakurdwara, Govind Deo's Temple, Galtaji, etc., and some of the important *havelis* or the mansions, such as, Rajamal or Raja Ayamal *Haweli*[47], Natani's *dehra* (shrine), *havelis* of Paundarik Gangaramji, etc., and the *Kot* (City's wall). All these places mentioned above can still be identified since they retain their original names, and the gates, the market and the distinguished characteristics of the town, as well as its plan, have not undergone much change during the past centuries. *Rojnama-Imarat* of V.S.1790/1733 A.D. of Jaipur mentions about that the distanced or the far-flung areas, such as, *Jal-Mahal* or the Water Palace, Jhotwara Canal,

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[42] This map belongs to the first quarter of the 18th C.

[43] *Kapad-Dwara Catalogue,* Vol.II, *Maps and Plans, Op.cit,* Map No.107, p.79.

[44] *Yaddashti* (Jaipur), *Margh Sudi* 4, V.S.1789/1732 AD, Jaipur Records, R.S.A., Bikaner.

[45] *Siyah Hazur Papers, Chitra Vadi* 4, V.S. 1790/Wed., 21st Feb, 1733, *Chaitra Sudi* 9, V.S.1790/March 13, 1733 and *Chait Vadi* 10, V.S.1790/29th March, 1733, Jaipur Records, R.S.A., Bikaner; cf. Bhatnagar's *Life and Times of Sawai Jai Singh,* pp. 331-333.

[46] The colony built for the scholars and pandits by Jai Singh is just out side the town on the northern side. Here, two *havelis* that of Rajguru Jagannath Samrat and the Rajpurohit Ratnakar Paundarik were constructed before the building of the city. These *havelis* are in ruined condition today.

[47] Raja Ayamal's *Haveli* was completed in V.S.1788/1731 AD, *Yaddashti* (Jaipur), *Jyesth Sudi* 7, V.S.1788/1731 AD, Jaipur Records, R.S.A., Bikaner.

Raj-Chowk, *Satkhana-Mahal*[48], *Ghat-Darwaza*, were developed in that year[49]. *Toji-Jama-Kharch* of the same year gives details of the expenditure incurred on the building constructions in the City. Another source of that year shows that the construction in the City was carried on with speed[50]. A document related to the year V.S. 1790/1733 A.D. mentions that the instructions were given to Vidyadhar and *Diwan* Narayan Das to build a lemon-garden, later on which was extended towards the bank of Man-Sagar Lake[51]. Thus, the main sections and buildings of the City were completed by 1733 A.D.

Dastur-Komwar records that a rivulet named 'Darbhavati' was dammed in V.S. 1792/1735 A.D. and opened out into a lake called 'Man -Sagar'. The dam was built under the supervision of an architect Ganga Ram[52]. *Siyah-Hazur* of V.S.1792/1735 A.D. refers to the construction of 'Jai-Sagar' near Jaipur and launching of a boat in it[53]. *Imarat-Khana* document of Jaipur of V.S.1792/1735 A.D. mentions *Chandpol Bazar* or the market, *Manak-Chowk*, *Haveli* Haqimji, Jaigarh[54] and Nahargarh[55] forts, *Badal-Mahal* or the Cloud Palace and names of the labourers and masons who participated in the construction of buildings in the City[56].

A construction map (No.113)[57] mentions Topkhana, Rampol, Shivpol, Pahad-Ganj, Ram-Chowk, Chandni-Chowk and some dimensions and details of the city wall (*Kot*). Another map (No.294) also mentions the names of important *havelis* in the area between Rampol (Sanganeri Gate) and Ambagarh. Other construction maps in the *Kapad-Dwara Catalogue* (No.199, 200,204) show the progress in the construction of the

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[48] *Siyah-Hazur* (Jaipur) dated *Jyesth Sudi* 4, V.S.1791/1731 AD shows that *Usta* Khema, Vidyadhar Bengali and Hirdayaram Purohit were awarded by the ruler for building the *Satkhana-Mahal.*

[49] *Karkhanejat* (Jaipur), *Jyest Vadi* 2, V.S.1790/1733 AD, Jaipur Records, R.S.A., Bikaner; cf. G.S. Sharma, *Sources on Social and Economic History of Rajasthan*, p.196.

[50] *Yaddashti* (Jaipur), *Margh Sudi* 10, V.S.1790/1733 A.D., Jaipur Records, R.S.A., Bikaner.

[51] *Chitthi* (Jaipur) or the Letter dated *Chaitr Sudi* 14, V.S.1790/1733 AD, R.S.A., Bikaner.

[52] *Dastur-Komwar* (Jaipur), Vol.23, V.S. 1792/1735 AD, ff. 2, 42, 295, Jaipur Records, R.S.A., Bikaner; cf. G.N. Sharma , *A Bibliography of Medieval Rajasthan*, Agra, 1965, p.42.

[53] *Siyah Hazur* (Jaipur), Bundle No. 30, Jaipur Records, R.S.A., Bikaner.

[54] Vidyadhar was awarded for the repairing works completed at Jaigarh. *Siyah-Hazur* (Jaipur).of V.S.1793/1736 AD mentions about the construction of Ganeshji temple at the Dungar hill of Brahmapuri.

[55] The fort of Nahargarh or the Tiger Fort was initially known as the 'Sudarshangarh' –after god Krishna, R.S. Khangarot, *Jaigarh: The Invincible fort of Amber*, Jaipur, 1990, p.27; Jai Singh built a large part of Nahargarh shortly after the foundation of the Jaipur City and completed it in 1734 AD, P.V. Begde, *Forts and Palaces of Indian*, p.47.

[56] *Imarat-Khana, Karkhanejat* (Jaipur), V.S.1792/1735 AD, Jaipur Records, R.S.A., Bikaner.

[57] *Kapad-Dwara Catalogue*, Vol. II, this map belongs to the first half of the 18th C.

Ram-Ganj area on the eastern side of the town, though, these are dated after 1750 A.D. But the *Siyah-Hazur* of V.S.1794/1737 A.D., besides showing the rectangular town planning of the Jaipur City and space organization for different socio-economic groups of the society on the basis of their caste and profession, mentions about the construction of the *Chowks* or the squares in the City. It also mentions names of the market places, such as, Ramganj, Chandni-Chowk, Ram-Chowk, Parwat-Chowk, Vadganj, Raj-Chowk, *Rui-Mandi*, Top-Khana and Paharganj, and names of two gateways of the City, namely *Ghatpol* (one of the southern gates) and Gang pole (one of the northern gates)[58]. The significance of this document lies in the fact that for the first time, the reference of any northern gateway of the Jaipur City has been found. Thus, the reference of gates and markets in the eastern sector and some important *havelis* indicating the main land mark in the eastern sectors, at least on the main roads, had been constructed in or before 1737 A.D.

With the foundation of Jaipur, the importance of *Gha- Ki-Guni* or *Purana-Ghat*, which exists to the south-east of the City on the Agra road, was further augmented. The site not only served as the gateway to the State but also as the location of a number of pleasure gardens. As the valley line of the *Purana-Ghat* was deep and surrounded by green hillocks which provided a cool and shaded environment, Sawai Jai Singh chose the site to build summer palaces, gardens with water channels, garden *havelis* and garden temples. Many existing temples at the complex were modified in the course of time[59]. The Sisodia-Rani Palace and garden were built by Sawai Jai Singh in the most picturesque location at the eastern end of the *Purana-Ghat* for his queen belonging to the Sisodia family of Udaipur. *Vidyadhar-Ka-Bagh*, near the *Purana-Ghat*, was another lengthy garden laid by Vidyadhar Rao, the town planner of Jaipur town. It is said that Vidyadhar and his family lived in the adjoining palace named *Pila Mahal*. The *Rajnivas* and *Roopnivas* gardens and their small palaces features amongst the other remarkable structures built during Sawai Jai Singh's reign. Grand gardens with central water channels were followed by the symmetrical *Charbagh* or the square pattern.

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[58] *Ibid, Kartik Vadi* 4, V.S.1794/1737 A.D., *Op.cit.* it is entitled as "Peshkash Hazuri Topkhana".

[59] Cf. Jain, Shikha, *Princely Terrain*, p.18.

Jai Singh is also being credited with the revival of the spirit of the *Galta Tank*[60] through the construction of many temples near the sacred tank and on its access. In fact, the Galta Hill became the major focal point of the town of Jaipur where the Sun temple was constructed by the king on the top of the hill and a major axis of the grid-iron layout of the town of Jaipur was aligned with the Sun temple on the Galta Hill. The eastern gate of the walled town facing the Galta Hill is 'Surajpol' after the Sun Temple.

III

Just after completion of the main wards of the city of Jaipur, Jai Singh had applied to the Mughal Emperor for the Imperial recognition of his newly founded city. The new city was officially recognized by the Emperor Muhammad Shah to be the Capital of the State in 1733 A.D., after seven years of its foundation. As it is evidenced from the *Parwana* preserved in the *Kapad-Dwara* which reads as:

> "Maharajadhiraja Sawai Jai Singh has informed that he has founded a new city under the name of Sawai Jaipur in the Imperial territory near Amber and has requested that the name of Sawai Jaipur instead of Amber may be written in the Imperial records. His request has been accepted and it is ordered that Sawai Jaipur may be written instead of Amber in future"[61].

The Maharaja Sawai Jai Singh sought permission from the Mughal Emperor in 1717 A.D, before building a *pura* at Ujjain, which is known as 'Sawai Jaisinghpura'[62]. It is quite surprising that, though his State was under the Imperial territories, no reference, regarding such prior permission from the Mughal Emperor before laying the foundation of the new Capital City of Jaipur[63], has been found.

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[60] *Kapad-Dwara Documents*, Vol.II, Map Nos. 202, 297.

[61] Bahura, G.N., *Catalogue of Historical Documents at Kapad-dwara, Jaipur*, Part-I, (S. No.641), p.639, this *Parwana* was written by Zafer Quli Khan, *Khanzad* of the Emperor Muhammad Shah to *chaudharis, qanoongos, mutsaddis* and the public of *parganas* of Sarkar Amber, *Suba* Ajmer: dated-25th *Zilqad*, 15th regnal year of Muhammad Shah (April 28, 1733 A.D); The *Parwana* reads as follows:

> "Parwaanaa aj Jaafar Kulee khaane jaad Muhammad Shaah Baadshaah banaam Chaudharee, kaanoogoyan, mutsiddyaan va riyaayaa pirganaa Sarkaar Aamer Soobe Ajmer taareekh 15 Jildkaad san 15 Jaloosee ---
>
> Mahaaraajaadhiraaj Sawaai Jai Singhjee ne likhaa hai ki ahad mubaarik me ek nayaa shahar ba-ism 'Sawaai Jaipur' muttassil Aamer aabaad kiyaa hai isliye Aamer kee yewaj mo-allaa me 'Sawaai Jaipur' likhte rahen so manjoor huaa sarisat me 'Sawaai Jaipur' likhte rahen".

[62] Bahura, G.N, *Catalogue of Historical Documents in Kapad-Dwara, Jaipur*, Part.II, p.10.

IV

Kostof broadly classified the towns into two categories- spontaneous and planned[64]. In the latter, the ruler planned the town formally and then invited people of different castes or groups, specialized in different trades and occupations and gave them incentives and concessions for settling in the town. This is evident in case of the City of Jaipur, where the ruler, Sawai Jai Singh formally implemented the planning, and invited Brahmins from Varanasi to perform the religious rituals on the occasion of the City's foundation, and then invited influential merchants and traders, and artisans and craftsmen from different parts of Rajasthan and other places to promote trade and commerce. This is also verified by the Girdhari's *Bhojnasar*, which mentions that when the City was founded many rich merchants were invited to settle down and construct their houses in the City[65]. One such invitation to Ghasiram Murlidhar Purohit mentions that the buildings should be constructed according to the directions of Vidyadhar[66].

In V.S.1784/1727 A.D., Seth Bhikhanram Chaudhri of Delhi was invited to Jaipur and instructed to do the work of 'Sarraf', who issued *hundis* or the Bills of

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[63] The area was under the *Suba* or the Province of Ajmer and was the part of the 'Sarkar Amber'

[64] Kostof, Spiro, "Junction of Town and Country" in *Dwelling's Settlements and Traders*, ed. by Nezar Ali Sayyed and Jean Paul Bourdier, New York, University Press of America, p. 111.

[65] Girdhari's *Bhojnasar* (*Doha* no.187) mentions that Sawai Jai Singh ordered:

> "Beg basain yak varsh mai baarahai kos hee fer,
> Des-des ke boaliyoa viyopaari sunihairi"

[It (the city of Jaipur) should be populated in one year and should be twelve *kosas* (miles) in extent and merchants from different places should be called to stay here and to make it their home.]

[66] This invitation letter from 'Sawai Jai Singh to Ghasiram Murlidhar' reads as follows (also quoted by A.K Roy, *History of the Jaipur City*, *Op.cit*, p. 51.):

"Siddh Shree Mahaaraajaadhiraaj Mahaaraajaa Shree Sawaai Jai Singh Jee deo bachnaat Ghaaseeraam Murleedhar pisesoo parsaad vaanchiyaa. Apranch. tu apnee khaatir jamaa raakh Sawaai Jaipur me aaye-haat *haveli* vadhaaye. vinaj-viyopaar keejyo. Haasil *raahdaaree* tathaa *maapaa* ko sakaar kee had me tu kanaa saithaanee so adhikaaree leejai lau vaa *nikaashu* sadaa mandee maaf aur parwaanon Vidyaadhar ne inaayat huo hai so thaaro gaur raakhelau toone Vidyaadhar kahai tin maafak keejeo. *Miti maadvaa Sudi* 9, V.S.1786/1729 AD".

Exchange[67]. In the next year, skilled artisans from Agra were invited to do *jari* work and various facilities were also provided to them[68]; and Seth Ghanshyamdas Chaudhry was given *Chaudhrahat* of Jaipur (*Chaudhry* or the head of 'Pargana Sawai Jaipur') and he was instructed to make laws regarding the tax realization from traders[69]. In V.S.1786/1729 A.D., traders from Bikaner were invited to construct their shops and houses in Jaipur[70]; and in the same year, the Brahmans and the *Mahajans* or the money-lenders of Amber were also ordered to settle down in the newly founded City of Jaipur[71]. Besides settling down the merchants (money lenders) and traders, it was made mandatory for the *Jagirdars* of the State to build their houses in the newly founded Capital City of Jaipur[72]. Moreover, *Jagirdars* had to bear the cost of their buildings in the installments[73]. In other words, the houses were built by the state and later their costs were realized from the *Jagirdars* in installments. There are large numbers of such houses in all the *Chowkries* or the squares of the City except *Chowkri* Topkhana-Hazuri[74].

V

Nomenclature of the localities in the City suggests that Sawai Jai Singh and his architects used names prevalent in the contemporary Rajasthan e.g., Brahmapuri, Chandpol, Surajpol, Kisanpol, Shivpol, Rampol and Gangapol gates, etc. Jai Singh also borrowed and adopted names from Shahjahanabad e.g., Chandni Chowk and Tripolia, Dariba Atish,

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[67] *Parwana* (Jaipur), *Chait Vsdi* 1, V.S.1784/1727 AD., Jaipur Records, R.S.A., Bikaner.

[68] *Yaddashti* (Jaipur), *Chait Sudi* 11, V.S.1785/1728 AD., Jaipur Records, R.S.A., Bikaner.

[69] *Parwana* (Jaiapur), *Shravan Vadi* 13,V.S.1785/1728 AD., Jaipur Records, R.S.A., Bikaner.

[70] *Chitthi* (Jaipur), *Bhadrapad Sudi* 9, V.S.1786/1729 AD., Jaipur Records, R.S.A., Bikaner.

[71] *Chitthi* (Jaipur), *Bhadrapad Sudi* 3, VS.1786/1729AD., Jaipur Records, R.S.A., Bikaner.

[72] Sharma, G.S., *Sources on Social and Economic History of Rajasthan*, *Op.cit*, p.198.

[73] *Parwana* (Jaipur), *Marg Sheersh Sudi* 9, V.S.1784/1727 AD, Jaipur Records, R.S.A., Bikaner; A.K. Roy suggest that besides inviting many businessmen to the City Jai Singh, it seems, made it almost obligatory for all the important *Jagirdars* of his State to build their houses in the City (Roy, A.K., *History of the Jaipur City*, *Op.cit*, p.58). One indirect confirmation of this is the fact that though the houses belonging to the *Jagirdars* of various clans of the *Kachhwaha* Rajputs exist with in the city walls, there is no house of any of the important Shekhawat *Jagirdars* such as Sikar, Khetri, Bisau, Mandaun, Nawalgarh, etc. with in the city walls. Shekhawats never clearly accepted the over lordship of Jai Singh or his successors (Will's Report), *ibid*, p. 59; Hanuman Sharma in his *Nathawaton Ka Itihas* (p.163) mentions that he had seen the copy of an order which was sent to all the *Jagirdars* in the State. The order dated *Chaitra Vadi* 6, 1785 V.S./1728 A.D. informed them that houses would be built for them in Jaipur City and they should pay for the buildings in installment by sending 10 % of their annual income to Vidyadhar in Jaipur regularly. Whoever pleaded poverty was given money for their construction out of Government funds; cf. Sarkar, J.N, *A History of the Jaipur City*, *Op.cit*, p.207.

[74] On the basis of one estimate it was found that there were 19 large residential buildings belonging to the *jagirdars* in *Chowkri* Topkhana Desh alone, A.K. Roy, *History of the Jaipur City*, p. 59.

Motikatla and Nakkhas, Jaleb Chowk, Sireh Deorhi, Diwan-i-Am (*Sarvatobhadra*), Diwan-i-Khas, etc.[75] The names of *Chowks* or the squares are indicative of the Mughal Planning System inspired from the palatial structures of Shahjahanabad[76]. The naming of the cluster or the street is associated with the political or religious centre and is often named after the most influential aristocrat in the cluster[77]. The religious centre of the cluster- the temple or the well- is the basic point of organization, as the social and religious life of the inhabitants of the cluster revolves around these[78].

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[75] Bahura, G.N. and Chandramani Singh, *Catalogue of Historical Documents in Kapad-Dwara, Jaipur*, Part. II- *Maps and Plans,* Jaipur, 1990, Cat. Nos. 101 (Plan of a market *Chandni-Chowk* at Shahjahanabad, Delhi, 18th C.) and 180 (Map of Shahjahanabad, Delhi, 18th C.).

[76] The market of Shahjahanbad (Delhi) i.e. *Chandni-Chowk* was constructed at the time of City's foundation i.e. in the first half of the 17th Century, then why the plans of this City and its markets were prepared at Jaipur, a Century later? And what was the motive behind it? One logical argument behind it is that the preparation of these plans, just before foundation of the Jaipur City and its markets by the architects of Jaipur and adoption of some names from these places, logically suggests that these plans were prepared for some idea and inspiration from the Mughal tradition of building architecture and planning, and expanding it further to achieve 'utilitarian' and 'aesthetic' elements of medieval building architecture. But as a matter of fact, the architects and planners of the Jaipur City did not borrow completely the Mughal elements of town planning as it is shown from the town planning at the walled City of Jaipur which ,contrary to the Mughal tradition, is based on "chess-board" or the "grin-iron pattern"

[77] In Jaipur, a typical cluster or street had the following qualities: The ritualistic centre: A temple or well in the cluster that was used for rituals at the time of festivals. These were usually built by the most influential *haveli* owner in the cluster. The political centre: The scale of the dwelling in the cluster established the status of the owner. The association of a particular *haveli* with the temple or well in the cluster also emphasized the status of the owner. For example, the *haveli* of the Rajput *Thakana* in Uniara Rao's *Raasta* at Jaipur, has a temple of Shanicharji, and the *haveli* in 'Vidyadhar Ka Raasta' at Jaipur, has a Shiva temple. The Paths and *Chowks* associated with the cluster were also named after the most influential *haveli* owner in the cluster e.g. Pandit 'Shivadin Ka-Raasta' in *Chowkri* Modikhana, Uniara Rao's *Raata,* etc. Dwelling cluster, which are sub-divided into the following clusters: (i) *Caste clusters*, consisting of groups of people of the same caste and occupation, for instance, the Brahmin Haveli in Brahmapur (ii) *Fraternal clusters*, comprising of families of two or more brothers such as Bhatt *Haveli* in *Chowkri* Modikhana (iii) *Single family cluster*, consisting of a single family and its *zenana* (ladies) and servant's section, for example, the *Tatterkhana* House in Jaipur (iv) *Religious clusters'* formed around a religious cult as in the case of the Dadupanthi *Havelis* in Sanganer.

[78] In pre-modern times, the name of the town was usually associated with the political or religious centre, as in the case of 'Amber' which was associated with the Ambikeshwar temple, and with Sawai Jai Singh in the case of 'Sawai Jaipur' or 'Jainagar', Sawai Madho Singh in case of 'Sawai Madhopur', etc.

(B) TOWN PLANNING OF THE CITY

In the pre-modern period, there were two broad categories of towns – spontaneous and planned[79]. In the latter, the ruler planned the town formally and then distributed space to different classes of society according to their socio-economic and political status. Town Planning means the preparation and implementation of a suitable ground plan to meet the needs of a particular type of town. In other words, it means putting down on paper the plans of roads, residential area, sewage system, water supply system, play grounds, education centre, office area, recreational centers and a host of other things, and thus of coarse implementing this plan. The plan must not only fit the Topography of the place and be suitable for its climate but it should also meet the needs of the society[80] according to its habits, and customs, festivals, fairs, economic conditions, means of livelihood, etc. All these factors are taken into consideration by the modern town planners[81]. Before the advent of modern ideas of town planning, town planning meant mainly two things, basic layout or a ground plan for roads and perhaps drainage for storm water and secondly in India the distribution of the various castes and occupations in different sections of the town.

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[79] Kostof, Spiro, "Junction of Town and Country" in *Dwelling's Settlements and Traders*, ed. by Nezar Ali Sayyed and Jean Paul Bourdier, New York, University Press of America, p.111; For details see, K. Siddhartha and S. Mukherjee, *Cities, Urbanization and Urban Systems*, Delhi, 2000, and Sjoberg. G., *The Pre-Industrial City, Past and Present*, New York, 1960.

[80] The city had to be planned keeping certain fixed features already in existence and before laying down the town physically, a proper planning has to be done to organize the space in different forms. Jai Singh and his ministers planned the City of Jaipur keeping in view the topography of the area and the existing Jainiwas garden. But it took some time to plan and manage for adequate resources and competent planners to carry it out successfully according to his wishes. It is said that it took about fifteen years to finalize the plan of the walled City of Jaipur. In preparing the plan Jai Singh introduced his own ideas also to shape his dream city which were based on his mathematical and astronomical knowledge acquired through the study of both classical and contemporary available books on these subjects and discussions with the learned scholars. There are several original plans preserved in the City Palace Museum (Jaipur) which were prepared by the master architects and his associates, submitted to the Maharaja for his instructions and approval. Thus, when all the plans were approved, the foundation of the new city was laid .Special attention was given to accurate measurements, rhythmic structures, ventilation, open space, uniform major roads through straight streets providing all facilities to the public. Like Kautilya's ideal town, Jaipur was regularly planned through the contours of the site inhibited the complete realization of the ideal square, as shown in the earliest City Map No.L.S./14.

[81] Also, the plans will vary depending on the nature of the towns. An administrative town will have a plan which is different from the plan of an industrial town.

I

India had a long tradition going back to antiquity for planned town. Development of brick technology and its standardization was a prelude to the planning of cities[82]. As far as a planned town with 'Grid-Iron Pattern' or the 'Chess-Board System' of street planning[83] in northern India before Jaipur is concerned, we have to go back almost to the proto-historic times when we have examples of the cities of the Indus Civilization i.e. Mohenjo-Daro and Harappa, and of later period the second city of Taxila i.e. Sirkap. However, Mohenjo-Daro was indeed a planned town; it would appear that though a much smaller town Mohenjo-Daro's planning had some similarity with the planning of Jaipur[84].

The excavations at Taxila have revealed three successive city-sites Bhirmond, Sirkap and Sirsukh. Of these, Sirkap had a planned layout. The second city Sirkap founded by the Bacterian Greeks in the second century B.C. and later built by Scytho-

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[82] Rehman, A., *Maharaja Sawai Jai Singh and Indian Renaissance*, New Delhi, 1987, p.44.

[83] Regarding the origin and adaptability of the 'Grid-Iron Pattern' or the 'Chess-Board System' of street planning, B.B. Lal, author of town planning in Ancient India, explains, "The streets of India were arranged and planted according to what is known as the rectangular Chess-Board System of street planning. That is to say that the streets were laid out in parallel rows cutting one another at right angles. Ancient town planning whether Greek, Roman or Indians, has been based on the straight lines and the right angles. This is the most natural method of street-planning that suggested itself to the unsophisticated mind of the Indian civil architect, but this is also the most generally recognized one even in modern times, because the rectangle is [the] most convenient for building block. Sister Nivedita would however trace the origin of the rectangular plan of the laying out streets to the predominant occupation of Indians which is agriculture, i.e. the labour in the paddy fields. And certainly in the Indian Jaypore [Jaipur], we have the rectangular plan of the rice fields reproduced with their intersecting paths" [Civil and National Ideals, p.10]. I need hardly add that the streets were all straight [*Mayamatam*, Ch.10, L.182]", cf. B. B. Dutt, *Town Planning in Ancient India*, New Asian Pub., Delhi, 1977, pp.177-178; For more details regarding the origin of the Grid-Patterns of town planning, see *The Origin and Spread of the Grid-Pattern Town* by D. Stanistawski, Geographical Review, 36, 1946.

[84] The mounds which represent the city of Mohenjo-Daro today cover a square mile, and have been confirmed by excavation which has also revealed the details of the similar streets and lanes in some areas. Combining these pieces of evidence, the published plan suggests that the basic layout was that of a grid iron of main streets running north-south and east-west, dividing the area into blocks of roughly equal size and approximately rectangular, 800 feet east-to-west, and 1200 feet north to south. The existence of six and probably seven of these blocks has been proved by excavation, as have two main streets at right angles (East street and First Street), and part of a third to the east of and parallel with First Street. The denudation of the edges of the mounds renders the perimeter of the city- uncertain in out line and exact position, but of the layout indicated by the central-street plan was continued symmetrically, we would have a square city a mile across comprising twelve major building blocks in three rows of four, east-to-west. The central-western blocks, on this reconstruction layout would be the citadel, occupying a position commensurate with the distinction implied by its foundation. The main street unpaved, seems to have been up to 30 feet wide and with in the main blocks was an irregular network of small roads, lanes and alleys roughly following the general lanes of the layout and dividing the block into individual houses, S. Piggot, *Pre Historic India*, p.165.

Parthians' on the typically Greek's 'chess-board' pattern, with streets cutting one another at right angles and regularly aligned blocks of buildings, provides a contrast in layout[85]. It has been conjectured that Sisupalgarh in Orissa was also a planned city. However, no indications of the existence of such streets have been found in the actual excavation, and the existence of a grid pattern can only be conjectured. One peculiarity of this fort or town walls of Sisupalgarh is that these walls are not oriented exactly along the cardinal directions, but are turned about 13 degree in the clockwise direction. The Jaipur city walls are turned 15 degree away from the cardinal direction clockwise i.e. almost by the same angle[86]. There is yet no definite evidence of planned city in India in the nearly two thousand years which passed from the time of Taxila and until the foundation of Jaipur in 1727A.D. During the gap of this long period, we find only one example of a medieval city i.e. Shahjahanabad which had only two planned streets[87].

II

The present description of the town-planning of the walled city of Jaipur is based mainly on the physical survey of the present walled city, contemporary documents and planning maps prepared by the architects of the City- available at the City Palace Museum, Jaipur and elsewhere, and accounts of the foreign travelers describing the City of Jaipur.

The walled city of Jaipur is broadly divided into two portions by one long and very wide road running east to west[88] from Surajpol Gate to Chandpol Gate. This is the City's main axis-road (east-west axis), lying on a natural ridge stretching in line with the foot of Nahargarh hill on the west for about 4 km till the sand dunes on the foot hill of Galtaji and which is slightly inclined to the south-east direction. Its length is about 3 and a quarter kilometers and its breadth is about 33 and half meters. This east-west axis road is crossed at right angles by three other straight roads having the same width in the north-south direction, dividing the City in many rectangular blocks or *Chaukris*[89]. Out of these three roads, the middle one is coincided with the City's second coordinal axis i.e. north-south axis, which is about 2 kms long. To the south of east-west axis road, there were four residential blocks from west to east, these are Topkhana-Desh, the block combining the present sectors Modikhana and Visheshwarji, Ghat-Darwaza and Topkhana-Hazuri. To the north of this road, there were five blocks from west to east these are Purani-Basti, Palace, Ramchandraji, in the north-east Gangpol *Chaukri* and Brahmapuri in the north-west. All the blocks are having regular shapes except the Brahmapuri and Purani-Basti whose southern and eastern sides are straight roads but northern and north-western boundaries are irregular[90]. The central block i.e. Palatial Complex, which is the largest one, is occupied by the Royal Palace, Govind-Deva Temple, the famous Observatory, Jainivas Garden, Talkatora Lake, and other buildings[91]. All together, there were nine blocks or *Chaukris*. All the blocks, except the Palace, Gangpol *Chaukri* and Brahmapuri, seems to be of almost equal size.

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[85] Cf. A.K. Roy, *History of the Jaipur City*, p.33.

[86] This point was noticed by G. Bretzler in his Ph.D-Thesis (*Jaiput-Studies Zur Stadt-Und Sozialgeographie einer Indischen Gross Stadt*, Ruhr University, Bochum, 1970, p.142; cf. Roy, *History of the Jaipur City*, *Op.cit*, p.34.

[87] According to Bernier (*Travells*, p.245),

> "There were two straight roads leading into the square (in front of the Red Fort) may be five and twenty, or thirty ordinary paces in width. They run in a straight line nearly as far as the eye can reach but the one leading to the Lahori Gate is much the larger".

[88] See Plate No. 2 (B)

These *Chaukris* or the blocks are further sub-divided into the smaller rectangular and square blocks by a large number of block streets and lanes parallel to both the cardinal axes and again crossing each other at right-angles[92]. In this way streets are either parallel or perpendicular to each other. The width of the streets decreases from the main roads at the primary level having the average wideness of 33 ½ meters, block streets at the secondary level having too much variations, and lanes behind individual houses at the tertiary level having the average wideness of one and a quarter meter.

At the crossing sections of the east-west axis road and the other three perpendicular main roads, there formed three squares called *Chowks* or *Chaupars* with a side three times the breadth of the main road. The western *Chowk* is called *Chhoti-Chaupar* or the 'Amber Chowk'[93], the central *Chowk* is called *Bari-Chaupar* or the 'Manak-Chowk'[94] which is the meeting point of both the cardinal axes, and the eastern one is called 'Ramganj-Chowk'[95]. These *Chowks* are the busiest centers of the walled city.

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[89] See Original Plan (L.S./14) of the City, Plate No. 1, and Final Plan of the City.
[90] See Final Plan of the City.
[91] See Sketch Plan of the Palatial Complex.
[92] See Final Plan of the City.
[93] See Plate No. 19 (C)
[94] See Plate No. 15 (C)

On the main roads there are City's main markets or *bazaars* having shops on both the sides with uniform shape and size which gives a very pleasant look to the walled city[96]. The east-west axis-road have three main markets i.e. *Chandpol Bazaar*[97] - *Chandpol* Gate to the *Chhoti-Chaupar*, *Tripolia Bazaar*[98] - *Chhoti-Chaupar* to the *Bari-Chowk*, Ramganj *Bazaar* [99]- *Bari-Chowk* to the *Ram-Chowk*. The southern markets are *Kishanpol Bazaar*[100] - from Ajmeri Gate to the *Chhoti-Chaupar, Chaura-Raasta-* New Gate to the *Tripolia* Gate, the shops on this road appears to be more modern, Jauhri *Bazaar-* Sanganeri Gate to the *Bari-Chaupar*, *Chaar Darwazaa Bazaar-* Ghat Gate to the *Ram-Chowk*[101]. And the northern markets are Gangori *Bazaar*[102]- *Chhoti-Chaupar* to the Chogan-Stadium, *Sireh-Deorhi* or the *Haw- Mahal Bazaar*[103] and *Moti-Katla Bazaar* to the east of the Palace Block.

The network of the major roads and streets and the formations of the residential blocks and their subdivisions shows that the walled city is based on the 'Grid-Iron Pattern' or the 'Chess-Board System' of street planning i.e. the main roads and streets cross each other at right-angle; and thus it forms a network of street planning which joint each and every part of the City by the shortest distance. Up to some extent, this pattern is maintained at almost every level within the city walls except the eastern block Topkhana-Hazuri, the eastern part of the Ramchandraji *Chaukri* where their subdivisions show a haphazard planning and Gangapol *Chowkri* which shows that these three blocks are of later development. Thus, the layout of the City's artery roads & streets and the uniform look of its main markets give the walled City of Jaipur a planned look.

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[95] See Plate No. 15 (B)

[96] See Plate Nos. 15 to 22.

[97] See Plate No. 22- (A), (B) & (C).

[98] See Plate No. 17 (B), 19 (A) & 21 (B)

[99] See Plate No. 15 (A)

[100] See Plate No. 20 (C)

[101] Along the southern city wall, from west to east there are- *Indra Bazaar, Nehru Bazaar, Bapu Bazaar* and *Sanjay Bazaar*. These markets were built later on, as the shops on these markets also seem to be of later development.

[102] See Plate No. 21 (A)

[103] See Plate No. 20- (A) & (B)

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The old Jaipur City (the 'Pink City'), is enclosed by the fortified wall[104]. It is 20 to 25 feet in height and its thickness though varied, is about 9 feet at the base. The circumference of the fortified wall is about 9 km. At the top the wall is crowned with battlement motifs though these battlements are meant for decorative purpose with no functional use. Ditch or moat around the city wall is conspicuously absent, though medieval cities generally were accomplished with enclosure and moat. It is the fortification wall which gives the shape of an irregular rectangle to the City, due to its irregularity in the north-western side

At present, the wall is absent in the north-west of the City between *Brahmapuri* and *Chowkri Purani-Basti.* But there are remains of the old city wall around *Brahmapuri,* observed on the road to Gaitor during the course of my survey. *Kapad-Dwara Catalogue* Map No.287 also shows a *kot* or the wall which was constructed from the 'Jainiwas Talab' i.e. 'Talkatora' Lake to 'Kanak-Bagh' (between Jaipur and Amber) and its dimensions are also mentioned[105]. The remains of this wall demarcate the eastern boundary of the Brahmapuri Colony, from the Palace Complex to the foot-hills of Gaitor. The absence of the city wall between Brahmapuri and *Chowkri* Purani-Basti, and presence of Samrat gate again indicates Brahmapuri as a part of the City, as also reflected by a contemporary document which shows that Brahmapuri was planned to be built as a part of the Jaipur City[106]. And the remains of the old city wall around Brahmapuri can still be observed on the road to Gaitor. It is possible that the present city wall as shown on the north-western edge of the town might be incorrect and the northern walls of the *Chowkri-Sarhad* are just fortifications of the Palace Complex, not the original city wall[107].

Another important map that indicates that the northern area above Talkatora was part of the earlier walled city is Map No.45[108]. It shows the position of *havelis* of significant ministers i.e. these are located in the north beyond the bank of Talkatora and include the Rajamal's *Haveli* with an area of 4 *bighas* and a quarter, which belong to the Prime Minister of Sawai Jai Singh. If this area was out side the walled city it would have been specified as in the Map No.54 (*Kapad-Dwara Catalogue*), which mentions the land allotted to several Rajput Thakurs out side the city wall on the western side.

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[104] See Plate No. 2 - (A) & (B)

[105] The length, breadth and height are given in yards, as 4500, 36 and 4 respectively, cf. *Kapad-Dwara Catalogue, Vol.II, Maps and Plans, Op.cit,* Map No. 287.

[106] *Rajnamcha- Potedar* (Jaipur), V.S.1783/1726 AD, Jaipur Records, R.S.A., Bikaner.

[107] Jaipur City underwent significant transformations in the period of Ram Singh-II (1835-1880 A.D.) when the original water system became redundant- 'Rajamal-Ka-Talab', which existed to the north-west of Talkatora Lake, and 'Kunds' or the water tanks existed in the squares of the cardinal roads of the City were filled up. It is possible that even the city wall on the northern side was redefined in this period.

[108] *Kapad-Dwara Catalogue, Vol.II, Maps and Plans,* this map belongs to the period 1725-50 AD.

Since Jaipur is surrounded by Nahargarh, Jaigarh, Ganeshgarh and Shankargarh and further by Raghunathgarh and Ambagarh forts on the north and south of Galtaji, these fortifications in turn ensure, at least from three sides, a complete enclosure of the Jaipur City. Thus the city wall of Jaipur was naturally protected from three sides by the hills but the southern city wall is without any natural defense.

Though, at present there are eleven gateways provided in the fortification wall of the City in different directions, originally only eight city-gates[109] were built during the period of Sawai Jai Singh (as discussed earlier)[110]. The location of these gateways is as follows:

-*Surajpol* in the east
-*Shivpol* or *Ghat-Darwaza*, *Rampol* or the Sanganeri Gate and *Kishanpol* or the Ajmeri Gate in the south
-*Chandpol* in the west
-*Brahmpol* or the Samrat Gate, *Dhruvpol* or the Zorawar Singh Gate
-*Gangapol* in the north.

The peripheral demarcation of the City i.e. the town walls were guided by the location of these gates. Most of the gates are of *Tripolia* type having three arched (pointed) passage where mid one is bigger and flanked by smaller one, and the span of all the passage is equal. Central entrance of the gates is of little projected and both the corners of the central entrance are occupied by *Chattaries* or the pavilions at the top or roof level and flanking corners of the whole gate are again surrounded by *Chattaries*.

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[109] See Plate Nos. 4 to 8.

[110] As discussed in the previous section i.e. Foundation of the City, three city gateways namely, *Char-Darwaza* gate, Manpol, Singhpol or the New Gate are of later development and were built during the period of Maharaja Ram Singh-II.

Some gates are recessed in the fortified wall and others are little projected. All the gates are of different dimensions. The City of Jaipur runs on east-west axis and the main road thus seen from *Surajpol* (the eastern gate) to *Chandpol* (the western gate).

A few plans of the Jaipur City at the time of its construction are preserved in the palace. Most of these are land allotment plans for particular area of the City but map number L.S./14, the earliest available plan map of the City, is significant[111]. This map is a progress report of the construction of the City[112] in the initial stage. It shows the basic layout of the early Jaipur City and centric demarcations of the *Chaupars* or the squares with reports on the construction progress written on all sides of the main roads and *Chaupars*. – are shown on this map.

L.S /14 shows that the plan of the Jaipur City was developed initially with perfect symmetry in four *Chowkries* or the square sectors where central one was reserved for Royal residence, *Chowkri* Topkhana for Rajput Thakurs, *Chowkri* Purani-Basti for leading courtiers, *Chowkri* combining the present blocks Visheswarji and Modikhana[113] for traders. No road was originally planned to divide Visheswarji and Modikhana blocks and it is not quite clear when the present *Chaura-Rasta* and the *Tripolia* Gate were planned and built. The area now occupied by *Chaukris,* Ghat-Darwaja, Topkhana-Hazuri and Ramchandarji was left completely underdeveloped in the beginning. The map shows that the area was full of depressions, sand dunes, etc. these parts were included within the city limits by completing the city wall at a subsequent date. Originally only five bazaar or markets were planned for the City. These were later named as *Johri Bazaar*, *Sireh Deori Bazaar*, *Kishanpol Bazaar Gangori Bazaar* and *Chandpol Bazaar.*

According to the progress report given on the map L.S. /14, 162 shops were constructed by the State on each side of each of these bazaars, except that there were only 144 shops on the western side of the *Kishanpol Bazaar*. The area occupied by the 162 shops was 18 *bighas* in all cases. Only the 144 shops on one side of *Kishanpol Bazaar* occupied 16 *bigha* and 88 shops were constructed in the *Chandpol Bazar,* to the north-west of the *Kishanpol-Bazar*. All together, 1362 shops were constructed in the initial stage of the Jaipur building. All these shops were and are, therefore, of uniform size and shape and give the walled city of Jaipur a planned look.

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[111] See Plate No. 1. The date of this map is not clear. The V.S. year corresponding to A.D.1725 is mentioned on it.

[112] It is not according to scale since the palace is shown to be much smaller in area then it actually is.

[113] But clearly *Chaura Rasta* was never built like a bazaar, just as the *Johri Bazaar* was. The shops on the road appear to be more modern. There are today about ten important temples facing *Chaura Rasta.*

Rojnama-Potedar of Jaipur of V.S.1783/1726A.D. mentions town planning of the City and distribution of separate blocks for different groups of the society according to their socio-economic status. It records that the town was divided into wards meant separately for Brahmins, Rajputs, Vaisyas and other castes and professions. These wards were known as, 'Brahmanpuri', 'Kumarvas', Maheshwarivas (traders), 'Chinpavas', 'Telivas', etc. This caste and profession based space-organization in the City of Jaipur was also evidenced by Heber, who visited the City in 1820's. He mentions in his famous memoirs[114]:

> "We passed together through the opposite gates of the city, the uniformity of which throughout is very striking. My companions told me that it was laid out in quarters or wards, according to the rules of the *Shaster* (*Shastra*); one being for the Thakurs, another for the Brahmins, a third for the ordinary Rajputs, a forth for the caste of Kayts (Kayasts), or writers, a fifth for the Bunyans, or traders and sixth for the Gaowalas, or cow-keepers, while the seventh is occupied by the palace."

The land allotment plans available in the *City Palace Museum* show that Brahmin *Havelis* of Royal priests are square in most cases, and other plots are rectangular with smaller side facing the streets[115] which were allotted to private citizens, temples, etc. These allotment plans also show that some rectangular plots reserved for prominent persons were '*sawaya*' i.e. one quarter extra in area[116]. Where the buildings were due to be constructed, soon directions regarding the buildings i.e., area and other dimensions, were given[117], which show that the building line and the height of the buildings were regulated by the State under the supervision of the Minister Vidyadhar.

Thus, on the basis of the above analysis of the old city maps and plans, contemporary documents and outcomes of the physical survey of the present walled City of Jaipur, it can be safely concluded that initially the City was planned to be built in four blocks which grow to nine blocks in the successive stages of Jaipur building during the period of Sawai Jai Singh. But the eastern most area which was full of sand dunes, covered by the blocks Topkhana-Hazuri, Ramchanraji and Gangapol *Chowkris,* was left undeveloped during Jai Singh's period. Through, the development work in these blocks was completed by Jai Singh's successors, Ishwari Singh and Madho Singh, we find haphazard planning in these blocks and it seems as the population grows, the people occupied the undeveloped area.

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[114] Heber, R., *Narrative of a Journey through the Upper Provinces of India, 1824-25*, Vol. II. London, 1828, pp. 414-415.

[115] Map No. L S / 17. *City Palace Museum*, Jaipur.

[116] Roy, A.K., *History of the Jaipur City*, *Op.cit*, p. 41.

[117] Ibid, p. 45.

III

The original plan of the City of Jaipur was prepared by the chief architects and ministers of Jaipur under the direct supervision of Sawai Jai Singh. In this planning the name of his able minister Vidyadhar, a Bengali architect and an engineer as well[118], generally comes into light. Though, the official records do not mention Vidyadhar's contribution in the planning of the City, it was believed by his contemporaries that it was he who had prepared its detailed design. Girdhari[119] mentions that Jai Singh ordered Vidyadhar to found the City:

> "Ath Sawaai Jaipur basaayo taakau varnan,
> Puraakare bahu harsh kari manmahimod badhaaye,
> Vidyaadhar sau boli kahi saharsu ek basaaye"

[Sawai laid the foundation of Jaipur, the description of which is as follows: He laid out many streets, and thus enhanced the joy of heart. He said to Vidyadhara that a city should be founded here.]

Todd[120] writing nearly eighty years later mentions:

> "The merit of the design and execution (of the City) is assigned to Vidyadhar, a native of Bengal, one of the most coadjutors of Prince in his scientific pursuit, both astronomical and historical."

In fact Vidyadhar was promoted as Minister *Desh Diwan*-only in 1729 A.D. more than a year after the official foundation of the City. Official records however show that Vidyadhar had been rewarded a number of times for his good work as an engineer. He was, perhaps, the chief architect and engineer for the buildings of both state and private.

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[118] Sarkar, *A History of Jaipur*, *Op.cit,* pp. 216-217; cf. A.K. Roy, *History of the Jaipur City*, p. 41.

[119] *Bhojanasar*, *Op.cit*, *Doha* no.182.

[120] Cf. Tod, *Annals and Antiquities of Rajasthan,* Vol.II, *Op.cit.*

LAYOUT PLAN OF THE WALLED CITY OF JAIPUR

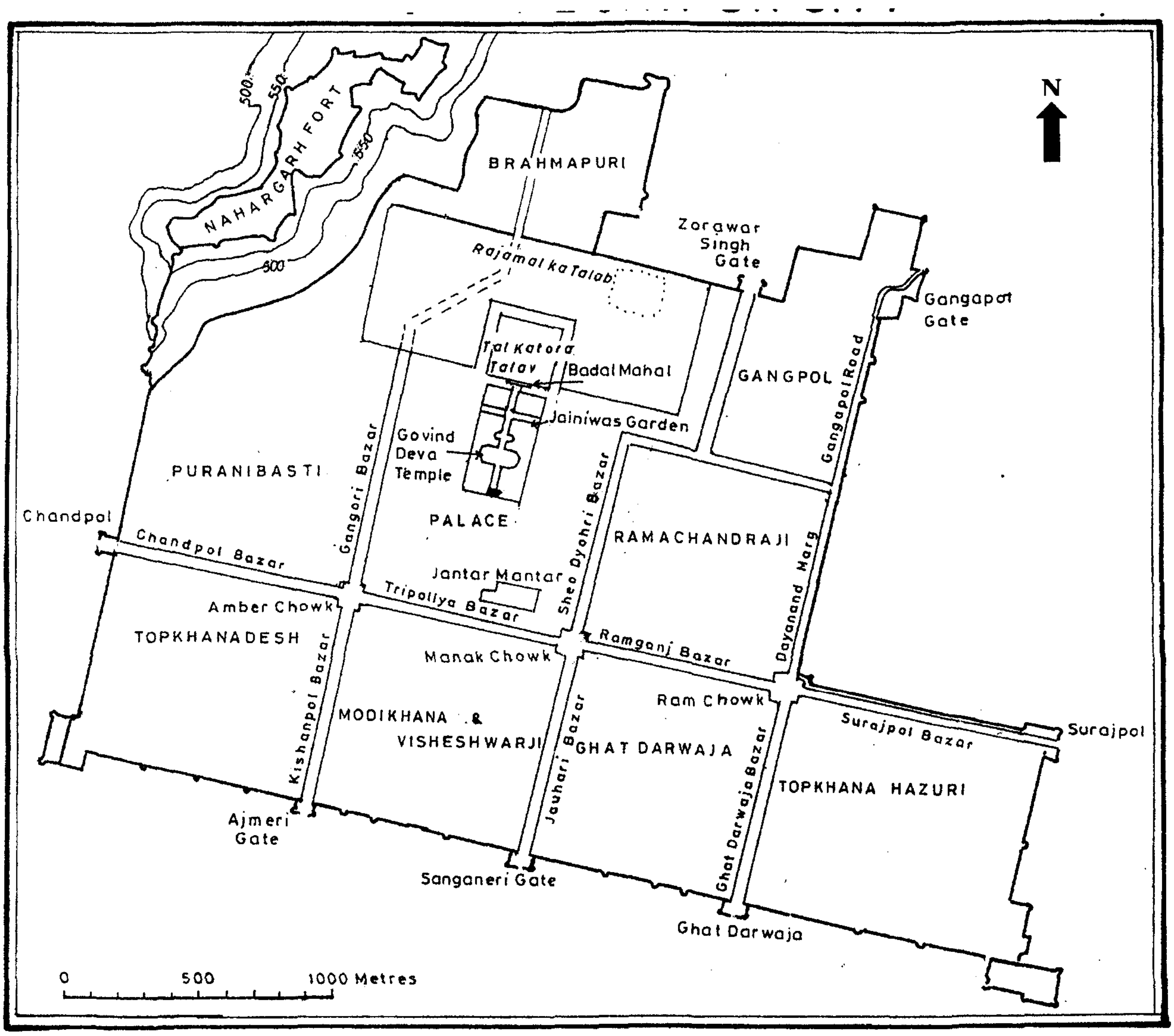

Fig.2

CHAPTER THIRD

BUILDINGS OF THE CITY IN AN ART-HISTORICAL PERSPECTIVE

Jai Singh's architectural activity was very prolific. Though Amber, since long before Jai Singh's time, was renowned for elegant palaces built on an eminence over looking artificially laid out well kept gardens, he imported a new dimension to architecture. His contribution surpassed the architectural activities of his predecessors both in extent and utility, without suffering in dignity either[1]. First he made extensive additions to the palace of his ancestors, but finding that his growing State needed a new Capital, he chose to build an entirely new city. Shortly afterwards, when he decided to build a new Capital, he commissioned a large number of buildings of varied nature in it. Now, he started to build in the successive stages, a large number of shops on both sides of the main roads, *Kot* or the city wall and the gateways, *havelis* or the mansions and other building structures in the rectangular blocks of the City.

The walled city of Jaipur is composed of buildings of various natures besides the city wall and gateways. It includes mainly, shops of markets, residential buildings, palaces, temples, official buildings, buildings of sub-imperial paraphernalia, *havelis* or the mansions, etc. All are set in a well-defined manner and planned way. On the basis of the contemporary sources and survey of the walled city of Jaipur which I have conducted, some common characteristic features of buildings of the City are discussed here

The land allotment plans available in the Jaipur City-Palace, show that Brahmin *Havelis* or the mansions of the royal priests are square in most cases, and other plots are rectangular with smaller side facing the streets which were allotted to private citizens and temples, etc.[2] These allotment plans also show that some rectangular plots reserved for the prominent persons were *'sawaya'* i.e. one and quarter extra in area[3]. Where the buildings were likely to be constructed soon directions regarding the buildings were given, according to which the buildings line, the height of the ground floor and the height of the buildings were monitored[4]. Vidyadher was the chief architect and engineer for the buildings both state and private. Apparently the construction of even private buildings was strictly regulated and their plan had to be approved by him[5]. Jaipur Records show that when the Jaipur City was founded, *Jagirdars* of the State[6] and Brahmans of Amber[7] were ordered to build their houses in the City[8], and many commercial groups from different parts of the country and Rajasthan were invited to settle down and construct their shops and houses in the City[9]. References mention that the buildings should be constructed according to the directions of Vidyadhar[10].

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[1] It is the volume of Sawai Jai Singh's architectural activity and the simplicity and decoration, and grace and strength of his buildings, characterized by a few distinguished structural and artistic features that put his architectural labours apart from those of his predecessors. Though not of the highest quality, his buildings will bear comparison with any other built during the eighteenth century and also with most of the buildings of the same class built in the semi-autonomous states and the provinces during the seventeenth century. Looking to the fact that the times were exceptionally chaotic and Jai Singh's main interest was astronomy his building activity remains a befitting testimony to his unusual caliber.

[2] Map No. L.S. /17, City Palace Museum, Jaipur.

[3] *Kapad-Dwara Catalogue,* Map No. 54, 45, City Palace Museum, Jaipur

I

The City of Jaipur was planned with straight and wide roads besides achieving an effect of beauty[11]. The uniformity of the City was very striking[12], as there achieved the almost uniform height and similarity of architecture of the shops and houses, built on the main roads[13]. This is specially striking on both sides of the Johri Market[14].

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[4] Ibid.

[5] *Chitthi* (Jaipur), 'Invitation Letter from Jai Singh to Ghasiram Murlidhar' dated *Miti Bhadva Sudi* 9, V.S.1786/1729AD, Jaipur Records, Rajasthana State Archives (R.S.A.), Bikaner.

[6] *Parwana* (Jaipur), *Chait Vadi* 6, V.S.1785/1728 AD, Jaipur Records, R.S.A., Bikaner. It informed the *Jagirdars* that houses would be built further in the Jaipur City and they should pay for the buildings in installments by sending 10 % of their annual income to Vidyadhar in the Capital regularly. There are large numbers of such houses in all the *Chowkries* or blocks of the City except *Chowkri* Topkhana-Hazuri. On a rough count it was found that there were 19 large residential buildings belonging to the *Jagirdars* in *Chowkri* Topkhana-Desh alone; cf. A.K. Roy, *History of the Jaipur City*, New Delhi, 1978, p.59, f.n.52.

[7] *Chitthi* (Jaipur), *Bhadra Vadi* 3, V.S.1786/1728 AD, Jaipur Records, R.S.A., Bikaner

[8] Hanuman Sharma mentions that he had seen the copy of an order which was sent to all the *Jagirdars* in the State, cf. H. Sharma, *Nathawaton Ka Itihas* (Hindi), p.163.

[9] *Chitthi* (Jaipur), *Bhadra Sudi* 9, V.S.1786/1729 AD, Jaipur Records, R.S.A., Bikaner; 'Invitation Letter from Jai Singh to Ghasiram Murlidahar', *op.cit,* it reads as: "Apranch tu apni khatir jama rakh Sawai Jaipur men aye- hat (shops) haveli (house) vadhaye vinaj- viyapar kijyo".

[10] Invitation Letter from 'Jai Singh to Ghasiram Murlidhar', *op.cit.* It mentions :

> "tune Vidyadhar kahe tin mafiq kijo" [You act as per the instructions of Vidyadhar]

[11] See Plate No. 2 (B).

[12] Heber, R., '*Narrative of a Journey Through The Upper Provinces Of India,1824-25*', Vol.II, London,1828, p.401,

[13] See Plate No.16, 17, 18, 19 (A), 21, 22 & 23. This uniformity has been spoilt to some extent by building constructed in recent years on the *Chaura-Rasta* (in front of Tripolia Gate), but other wise most of the other roads have maintained this regularity.

[14] See Plate No.16 (B), 17 (A).

Under the arcades of the palaces, temples and houses built on each side of the main streets which are the principal *bazaars* or markets, there exist thousands of shops with complete uniformity and symmetry of architecture[15]. The earliest plan map of the Jaipur City i.e. L.S. /14 (V.S.1782/1725 A.D.), preserved in the City Palace Museum (Jaipur), a kind of progress report of the construction work done during the first stage of Jaipur's foundation, clearly shows the construction of altogether 1346 *hatya* or the shops in the four oldest markets of Jaipur namely, Johri Market, Sireh-Deohri Market, Gangori Market and the Kishanpol Market. On each side of these markets, except one side of the Kishanpol Market which shows 144 shops and 88 shops in the northern side of this market on the main axis road which later developed as the Chandpol Market, 162 shops under construction are shown[16]. *Kapad-Dwara* (Jaipur) document, particularly related to instructions regarding the construction of a market place, provides us invaluable information related with the foundations of the shops on both sides of the main streets. Shops were ordered to be built on a raised plinth (*'kursi tai'* i.e. up to the plinth). The market place is divided into *Katlas* or *Mandis* (special markets) such as *Rui-Mandi* or the cotton selling market.

These shops were built for purely commercial purpose and allotted to different groups of professions. The State-sponsored construction of the commercial shops on such a big scale in a medieval city was rare phenomenon, unparallel in the contemporary India[17]. Since last three centuries these markets have been flourishing continuously, and presently some of its markets, such as *Johri Bazar,* have achieved world-recognition; and thus fulfilling the objective of their foundation.

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[15] See Plates of the main markets, such as, Kishanpol *Bazar*, Johri *Bazar*, Sireh Deohri *Bazar* and the Gangori *Bazar.*

[16] See Map L.S. /14, Plate No.1.

[17] Victor Jacquemont describes the main markets of the Jaipur City [cf. Jadunath Sarkar, *A History of Jaipur*, p.208], as :

> "The main streets are the principal *bazaars,* on each side, under the arcades of the palaces, temples and houses are the shops of the artisans, the tailors, shoemakers, gold smith, armourers, pastry-cooks, confectioners, copper-smiths, etc. The grain merchants occupy very spacious huts of thatch, constructed in a sort of course lattice work, ... in the midst of the main street. The stalls are removed wherever the Rajah issued from his palace. Delhi (Shahjahanabad) has only one similar road, namely the *Chandni Chowk,*: but at Jaipur all the roads resemble it and bear that name".

II

The old city of Jaipur, enclosed by the fortified wall[18] which is 20 to 25 feet in height and its thickness, though varied, is about 9 feet at the base. The wall is surmounted by battlements and gateways. The circumference of the fortified wall is about 9 kilometers, which has circular and semi-circular bastions[19] after a certain interval. The wall was built with the help of undressed stone and lime mortar, and also thickly plastered with lime mortar on both sides[20]. Exterior face of the wall is decorated with geometrical designs of rectangle, square, etc. giving the impression of blind doors and windows. At the top the wall is crowned with battlement motifs though these battlements are meant for decorative purpose with no functional use. On some part of the wall geometrical designs are absent, where the surface has been made smooth with lime plaster.

Though, at present there are eleven gateways in the walled city of Jaipur, originally only eight gateways connecting the main streets and roads of the City were built during the period of Sawai Jai Singh. These gateways were *Surajpol*[21] in the eastern side; *Chandpol*[22] in the western side; *Brahmpol* or the Samrat Gate[23], *Dhruvpol* or the Zorawar Singh Gate[24] and *Gangpol* or the Mathura Gate[25] in the northern side; and *Rampol* or the *Ghat-Darwaza*[26], *Shivpol* or the Sanganeri Gate[27], and *Kishanpol* or the Ajmeri Gate[28] in the southern side of the Jaipur City of Sawai Jai Singh. Though, these gates have not uniform dimensions, they have some common architectural features. All the gates of the City are beautifully decorated with some geometrical designs and human figures[29]. Most of the gates are of '*Tripolia*' type- having three arched passage where mid one is bigger and flanked by smaller one. All the three arches of the gates are pointed and the span of all the passage is equal. Central entrance of the gates is a little projected and both the corners of the central entrance are occupied by *Chattaries* or the pillared domed pavilions at the top or roof level and flanking corners of the screen of the whole gate are again surrounded by pavilions. These *Chattaries* or pavilions are composed of four pillars and above having dropping eaves, roofed by dome with finial. Some gates are recessed in the fortified wall and other are little projected towards outside.

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[18] See Plate No. 3 (A); This Plate shows south-western part of the city wall.

[19] See Plate No. 3 (B).

[20] See Plate No. 3 (A)

[21] See Plate No. 6 (B)

[22] See Plate No. 6 (A)

[23] See Plate No. 7 (A)

[24] See Plate No. 7 (B)

[25] See Plate No. 8 (A)

[26] See Plate No. 4 (A)

[27] See Plate No. 4 (B)

[28] See Plate No. 5 (A)

[29] See Plate No. 5 (B)

III

The finest buildings are in the royal sector or the Palace Complex which is situated in the north-western side of the *Bari-Chaupar* i.e. the central square[30]. It is composed of palaces, gateways, temples, royal offices, gardens, water works and carriers, ceremonial buildings and the astronomical observatory. All the major buildings of the Palace Complex are aligned in the east-west direction except *Talkatora* or the Palace Lake, *Badal-Mahal* or the Cloud Palace, gardens and its water carriers, and *Gobind-Deva* Temple, which exist towards the northern side in 90 degree alignment to the main axis. In the course of the passage of time, a number of structures were also built inside the complex. The palace with its gardens, occupies about one-sixth part of the City[31]

The whole Palace Complex[32] is surrounded by high walls and enclosures called *Sarhad.* The complex has provided with two entrances, one is in the form of 'Tripolia' i.e. three passage arched gateways which opens in the Tripolia Market- existing on the southern side of the complex, while the second entrance named as 'Sireh-Deorhi' i.e. boundary gate situated on eastern side[33] opens in the Sireh-Deorhi Market. After passing through Sireh-Deorhi Gate, on its western side, there is an another entrance gate known as 'Nakkar-Darwaza'[34] and then there is a courtyard or the spacious square namely 'Jaleb-Chowk'[35], which was built to provide accommodation to the security guards posted to defend 'Udaipol', an another entrance gate. Towards western side of the Jaleb-Chowk, a group of palaces, accessed through 'Udaipol', are existed which are inter connected through the three other entrances and courtyard. It includes 'Sabha-Niwas' or the *Diwan-i-Am*[36], 'Sarvatobhadra' or the *Diwan-i-Khas*, 'Anand-Mahal', 'Chandra-Mahal', 'Zenana' or the female apartment along with courtyard 'Pritam-Niwas Chowk' and 'Rajendrapol' and 'Ganeshpol'. Most of the entrances have arched recesses with semi-domes, decorated by different patterns in colour.

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[30] See fig.5, the City-Plan of the Jaipur City.

[31] Cf. Heber, R., '*Narrative of a Journey through the Upper Provinces of India, 1824-25*', Vol.II p.402.

[32] The City Palace is an imposing blend of traditional Rajasthani and Mughal art and architecture. The first building in it is Mubarak-Mahal built by Sawai Madho Singh-II, the second son of Sawai Jai Singh. There is a beautiful carved marble gate with heavy brass door on either side of the gate. There are fine frescoes depicting Hindu called. Inside this is *Diwan-i-Khas*. This is in the centre of the paved square called *Sherbata* or *Sarbata.* Here, there is a very big hall on a raised platform open on sides. This is *Diwan-i-Am* or the Public Audience Hall.

[33] See Plate No. 8 (B)

[34] See Plate No. 8 (C)

[35] One of the later courts of Jaipur is *Jaleb Chowk* which housed the guard. The court of the same name function at Amber is firmly attached to the palace- it is an extension of it. But the Jaipur *Jaleb Chowk*

'Sabha-Niwas' or the *Diwan-i-Am*[37] is a large hall which was at that time open on three sides, surrounded by a verandah having arches on three sides, the fourth side having latticed galleries for the use of the ladies[38]. Its high ceiling and stately marble pillars make it an impressive hall. The hall since much altered when Heber saw it. He describes it as:

> "A noble open pavilion with marble pillars richly carved rather inferior in size, but in other respect fully equal to the Hall of Audience in the castle of Delhi"[39].

There is another such court that encloses the large Hall of Audience immediately to the south-east of the palace (*Chandra-Mahal*). Now it is known locally as the *Sarvato-Bhadra* or *Diwan-i-Khas*[40]. It is a structure square in plan, built on a raised platform, and is open from all sides[41]. It too has double rows of marble pillars and arches with semi-circular curves[42].

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is quite separate and so only its name represents a recreation of Amber; cf. Tillotson, *The Rajput Palaces: The development of an Architectural Style*, p.178.

[36] The fourth court which houses the *Diwan-i-Am*, now serves the purpose of a Museum.

[37] See Plate No. 9 (C)

[38] Bhatnagar, V.S., *Life and Times of Sawai Jai Singh*, *op.cit.*, p.334.

[39] Cf. Heber, R., '*Narrative of a Journey through the Upper Provinces of India, 1824-25*', Vol.II, p.406.

[40] Tillotson, *The Rajput Palaces: The development of an Architectural Style, op.cit.*, p.178

[41] See Plate No. 9 (C)

[42] But regarding this building, Tillotson suggests, "This hall must originally have been a *Sabha Niwas* or *Diwan-i-Am*. The building now called the *Diwan-i-Am* was much later addition, built by Maharaja Sawai Pratap Singh (1778-1803), and it was presumably the building of this second *Diwan-i-Am* which caused the demolition of the first to *Diwan-i-Khas* (the original *Diwan-i-Khas* was the hall on the ground floor of the *Chandra Mahal* Again he suggests," though of an imposing size, the earlier *Sabha Niwas* and the court which surrounds it are weak in design. It is not so much the tedious pink wash which creates this effect as the meretricious white lime decorations applies on top of it. In white outline, niches are drawn on the *Sahha Niwas* and entire galleries on the flute walls surrounding the court. This is an architecture in which functional forms are reduced to symbolic drawing, an architecture which deliberately avoids plasticity by reducing to two dimensions and to outline those

Through a portal on the north one can enter the pillared verandah of the *Chandra Mahal,* the earliest and the most important part of the palace.[43] It has seven-stories- a number presumably chosen for its auspicious associations.[44] This seven storied palace is the most picturesque of all the buildings in the royal sector[45]. On the ground floor, in the north side, is the broad verandah with pillared gallery called the *Pritam Niwas*, from which a marble channel runs into the formal garden. This arrangement dittos the *Sukh Niwas* of the palace at Amber, and is one of several features which suggest an intention to re-create the Amber palace[46]. The main portion of the ground floor of the *Chandra Mahal* is occupied by a hall of audience. This is a small and rather low per style hall with cusped arches. Some variety to the last is provided in the rear portion of the hall by the use of trefoil arch, which may be termed as '*Buddhist*' because of their similarity in form to the trefoil niches of *Gandhara* and *Pala Bengal.*[47]

The main rectangle is in five storeyes of different height, first three defined by cornices and moldings, their plain facades being relieved by a pleasing arrangement of the arched windows and a variety of detail. A single high hall is expressed on the out side as the first two storeyes, which explain why those who attempt to name the seven stories of the palace can muster only six names. This hall, the *Sukh-Niwas*, was extremely remodeled in the Victorian period. The next two (fourth & fifth) storeyes, the *Rang-*

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forms which would most create it. Even the cusped and the main body is a smooth curve, so that the arch seems to be assembled from any distance the overall shape is indistinct. Except for these weaknesses, there is little in the design or the plan to distinguish the *Sabha Niwas* and its court from Mughal Architecture", Tillotson, *The Rajput Palaces: The development of an Architectural Style, op.cit.*

[43] Tillotson compares it with the *Juna Mahal* of Dungarpur which also have seven stories, Cf. Tillotson, *The Rajput Palaces: The development of an Architectural Style*, p.177.

[44] Ibid.

[45] See Plate No. 10 (A); Heber describes this palace (cf. R. Heber, '*Narrative of a Journey through the Upper Provinces of India,* Vol.2, p.402), as :

> "The palace with its gardens, occupies about one sixth part of the City. It presents to the streets an extremely high front of seven or eight, diminishing in the centre to something like a pediment, and flaked by two towers of equal height topped with open cupolas. Within are two spacious courts and many smaller ones, surrounded by cloisters of stone pillars, except to the verandah leading to the principal rooms, which are of marble".

[46] Likely, the Udaipur Palace sought to re-create Kumbha's Palace at Chittor, cf. Tillotson, *The Rajput Palaces: The development of an Architectural Style,* p.177.

[47] Tillotson, *The Rajput Palaces: The development of an Architectural Style, Op.cit,*

Mahal and the *Sabha-Niwas* repeat the plan of the *Sukh-Niwas*[48]. In these two storeyes the terraces, protected by graceful handrails, lend an air of openness to the whole structure, but the top two stories, the *Chavi-Niwas* and the *Mukut-Niwas,* are smaller in plan. The *Chavi-Niwas* is a *Sheesh-Mahal* and consists of three adjoining chambers, all richly decorated with inlaid mirror-work[49], while the seventh (*Mukut-Niwas*) is an open arcaded marble pavilion with curvilinear form of roof i.e. *Bangaldar*[50], flaked by two cupolas[51].

All these stories have projecting balconies on the exterior. Because all the stories follow the same rhythm of advance and recess, the balconies come immediately above each other in continuous vertical orientation. Further more the repetitive rhythm of the balconies, their monotonous form, and the multiplicity of their opening, all contribute to make the exterior cluttered and wearisome. The features are too small for facade of such size, the balconies and their *chhajjas* or the shades litter rather than define the architectural form[52]. The principal façade on the northern side facing a large ornamental garden with water channels, fountains, parterres, paved pathways which extend down below the *Govind-Dev* Temple up to *Badal-Mahal* or the Cloud Palace[53]. The formal entrance to the palace is on the eastern side through a number of imposing portals and squares including the two comprising *Diwan-i-Am* and *Diwan-i-Khas.*

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[48] Ibid.

[49] Tillotson, *The Rajput Palaces: The development of an Architectural Style, op.cit.*

[50] See Plate No. 10 (A); This feature in the architecture of Bengal was first introduced in Amber by Raja Man Singh; probably its earlier examples here are the pavilions in the garden at the foot of the palace fort of Amber and in the Govind Deo's temple near the ascent to the Amber Valley. Latter this feature, along with two others curved cornices and heavy marble pillars- became characteristic of Jaipur Architecture, cf. Bhatnagar, *Life and Times of Sawai Jai Singh,* f.n. 63, p.334; also cf. Heber, '*Narrative of a Journey through the Upper Provinces of India,* Vol.II, pp.402-404.

[51] Tillotson suggests, "the arrangement of its domes- a *bangaldar* roof flanked by round domes with which it shares a common cave- is an imitation of the *Jess Mandir* in the Amber palace", Tillotson, *The Rajput Palaces: The development of an Architectural Style, op.cit.*

[52] These features are also founded in the palaces of Chittor and Udaipur. Tillotson suggests, "But where as in those earlier palaces the narrowness of the balconies gives the groups the appearance of towers projecting from the façade, here they are wide so that the whole façade seems to alternate between two planes. This would be a powerful effect were it not that the balconies are also shallow- so that the two planes are not far apart- and they are linked horizontally by continuous straight balustrades which flatten the façade again and cancel what small effect the balconies do achieve", Cf. Tillotson, *The Rajput Palaces: The development of an Architectural Style,* pp.177-178.

[53] See Plate No. 10 (B)

The structural and aesthetical features of the palace *Chandra-Mahal* and its picturesque setting are remarkable[54]. An exceptional feature of the *Chandra-Mahal* lies in its symmetry[55]. The picturesque quality has been achieved by eliminating the irregularity as evident in the majority of the Rajput palaces[56]. However, the aspect of the Jaipur Palace which most it exceptional within the Rajput School, is of its parts. The more usual Rajput *garh* or the fort palace is an integrated unit of the palace and fortifications. The various parts of the palace, though of different date, attach to each other, and their fortifications are contiguous: originally the Jaipur Palace, at Jainiwas, consisted only of the *Chandra-Mahal* a single unit, and for it accorded with Rajput tradition. But its fortifications are separate: the palace compound is surrounded by a high wall, i.e. the *Sarhad.* And the major structures built in addition to the *Chandra-Mahal* are not attached to it but stand in separate courtyards. The Jaipur Palace in its complete state therefore conforms much more closely to the Mughal type of palace, with separate buildings distributed over a fortified campus[57].

The palace's formal garden or the royal garden called *Jainiwas*[58], to the north of the *Chandra-Mahal*, marks the site around which the city was founded. The palace gardens are extensive. They have the *Chandra-Mahal* on one side and the *Badal-Mahal* at the other and with *Govind-Devaji* Temple in the middle. This garden with its terraces and axial waterways, based on *charbagh* or the square pattern, and building of the pavilions within it, are again Mughal in style[59]. When Heber saw this garden, he beautifully described it as,

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[54] As a structural composition, some may be inclined to regard it even more pleasing and graceful than the famed Datra Palace, and though not giving the same impression of solidity and massive grandeur as the latter, has no feebleness in its conception and ideals either. It is on the other hand, more balanced structurally, and has a quiet grace about it to be found but rarely in the structures of the period.

[55] See Plate No. 10 (A)

[56] The other Rajput palaces such as the palaces of Bundelkhanda are of course symmetrical, but there the symmetry is essential to the dynamics of the designs. Here it is a reflection of a new order established in the design of the city, but it is otherwise gratuitous; the regular bulk of the *Chandra-Mahal* lacks both grace and interest, cf. Tillotson, *The Rajput Palaces: The development of an Architectural Style*, p.178.

[57] Regarding the Mughal influence on this palace, Tillotson suggests that this was the first instance of Mughal architecture influencing the over all planning of a Rajput palace- precisely that feature which is earlier building affords a major point of distinction between the two styles. Except for these weaknesses, there is little in the design or the plan to distinguish the *Sabha Niwas* and its court from Mughal architecture. The majority of the forms here used, though by no means of Mughal invention, are nevertheless those which were adopted in Mughal architecture, and the planning and massing of the hall, though a little clumsy, echo the pavilions of Delhi *Lal Qila* (the Red Fort) rather than Rajput precedents such as the Amber *Diwan-i-Am.* Only the *Jharokhas* projecting from the south wall of the court employ forms which were less often and opted in Mughal buildings and which recall an older Indian heritage. The rest varies from the Mughal style only in a certain rococo quality, created by the greater dependence on applied decoration to provide variety. The revivals of the Sanskrit term '*sabha niwas*' or '*sarvatobhadra*' does nothing to repudiate this Mughal appearance, *Ibid.*

[58] See Plate No. 11 (A); *Kapas-Dwara Catalogue, Jaipur, op.cit,* Map No. 276, mentions dimensions in yards and other features of *Jainiwas.*

> "...the gardens which, I was first taken to see, are extensive, and in their way, extremely beautiful, full of fountains, cypresses palm-trees, and flowering shrubs, with a succession of terraces and alcoves, none of them, singly taken, in good taste, but altogether extremely rich and striking. Two very large and handsome tanks ['Talkatora' Lake and 'Rajamal-Ka-Talab'] terminate the grounds towards the north. The garden is surrounded by a high embattled wall having a terrace at the top like that of Chester, and beneath it a common passage (as one of the ministers of State, who accompanied us, told me) for the *Zennanah* to walk in. the whole establishment of the palace and the garden seemed well kept up, considerably better than that of Lucknow, and every thing much exceeded my expectation except the military show, which was absolutely nothing."[60]

Two more structures at Jainiwas are the *Badal-Mahal*[61], over looking the *Talkatora*, and the *Govind-Deva* Temple, existing northward between the *Badal-Mahal* and the *Chandra-Mahal*[62]. Both show signs of extensive remodeling: the exterior façade of *Badal-Mahal* is clumsy comparing with the internal arrangements and is clearly by a different hand; and from the design of the *Govind-Deva* Temple it is evident that it was built as a residence and only later converted into a temple. However, the older parts of the structure are built in a late style: the cusps on the arches in the *Badal-Mahal*, for example, sprout in to leaves like those of *Safdar Jang's* tomb in Delhi[63] (C.1750).

The *Govind-Deva* Temple built by Sawai Jai Singh, though not conceived on the same scale as the one built by Raja Man Singh, but follows that in architectural character.[64] The temple of *Govind-Deva* is named as '*Govind-Mahal'* (literary palace) and is located on the upper most terrace of a Mughal style terraced garden with channels and fountains. It is axially aligned with the *Badal-Mahal* or the hunting pavilion at a lower level and the *Talkatora* or *Talab*, a large water body at the northern end of the Palatial Complex[65]. Its setting on the highest terrace of the garden, with the backdrops beyond is quite unusual. The temple itself is very simple and is constructed in the form of a Mughal *Baradari* with carved marble pillars with arches on the north and south side and closed rooms on the remaining two sides with the '*garbhagraha*' in the centre and a passage for circumambulation[66]. It is also without a porch and '*shikhar'*. The idol is installed in a rectangular hall surrounded by arcaded procession-path with a decorated ceiling. Its heavy but finely proportioned pillars supporting the arches were built in the characteristic Amber style. The shafts of the pillars are round and bulging at the base, taper upwards, the base and the abacus having broad petals carved in relief. In this and other temples[67] of this period, one noticeable feature is an almost total absence of figure carving[68]. Other decorative motifs and structural features, however, were introduced in these temples which were in harmony with their plain yet graceful façade.

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[59] Cf. Tillotson, *The Rajput Palaces: The development of an Architectural Style,* p.181; A very delightful system of fountains covers the middle of the paved path between the *Chandra-Mahal* and the *Badal-Mahal.*

[60] Heber, R., '*Narrative of a Journey through the Upper Provinces of India,* Vol. II, pp. 402-403.

[61] See Plate No. 11 (B)

[62] These have been identified by some as the original hunting ground lodges, Davar, Satish, "A filigiri city spun out of nothing,", Marg, Vol.XXX, No.4 (Sept.1977, p.43; cf. Tillotson. *The Rajput Palaces: The development of an Architectural Style, op.cit,* p. 181.

[63] In view of their late style it is unlikely that the pavilions do more than the sites of the original hunting lodges, Tillotson, *The Rajput Palaces: The development of an Architectural Style, op.cit* ,p.181

[64] Bhatnagar, *Life and Times of Sawai Jai Singh, op.cit.,* p. 335.

Regarding architectural features of these 'shikhar-less' *haveli* type temples, scholars have different opinions Shikha Jain[69] is of the opinion that the unique architectural style of the *Govind-Deva* Temple has also marked it as a dominant precursor of a new temple typology in Rajasthan i.e., the '*shikhara*-less *haveli* temples' of the eighteenth century, that are widespread in the region. This type was initially defined by the '*Pushtimarg*' of the *Vaishnava* sect. A prevalent myth states that in order to protect the temple during the Mughal rule of Aurangzeb, the *Vaishnava* sect started building temples in *haveli pattern*. However, the adoption to the *haveli* temple typology goes beyond this and is specifically designed to cater to the *Bhakti* Movement of that period.[70] In the words of R. Nath, "This simple design marks the culmination of the evolutionary process from the *mandira* type of '*Radhekunda*' to the *Baradari* type of the *Jayanivas* (*Jainiwas*) garden, and reflects the utmost simplification of the *Vaishnava* temple; almost the entire formalism of the classical Hindu temple as prescribed by the *Vastu* texts has been dropped, and it has became an incarnation of *bhakti,* pure and simple"[71]. According to Catherine Ashar, "The architectural vocabulary of the temple is parallel with the Mughal Public Audience Hall with its pillared façade, where either the deity or the ruler is positioned for *darshan.*[72] Thus, it seems that the adoption of 'shikhar-less' or the *haveli* type temple was more due to the influence of the Bhakti Movement of the *Vaishnava* sect which reflects purity

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[65] See Plan of the Jaipur City.

[66] Jain, Shikha (ed.), *Princely Terrain,* Gurgaon, 2005, p.109.

[67] Another temple with in the palatial complex is the temple of 'Sitaramji' and it is important to that this temple, as the private prayer space of the *Kachhwaha* was also located inside the *Chandra Mahal* and *Zenana* or the ladies section of the palace. Next to 'Govind-Deva', it was god 'Rama' that was worshiped by the Jaipur rulers. In fact, at the coronation of each Jaipur Ruler, a procession carrying this idol of 'Sita Rama' was taken to the earlier Kachhwaha 'haveli' or Manson in Amber where the *Raj Tilak* ceremony was performed. An analysis of the royal ritual processions in the City of Jaipur performed annually can possibly reveal more information about the city spaces and their hierarchical significance, Jain, Shikha (ed.), *Princely Terrain, Gurgaon*, p.118.

[68] The reason behind building these 'Shikhar-less' temples may be paucity of time. But the other opinion in this context is that besides involving much time and expenditure, it often became the chief cause of inviting the attention of the iconoclasts, and hence of its destruction, Bhatnagar, *Life and Times of Sawai Jai Singh*, *op.cit*

[69] Jain, Shikha (ed.), *Princely Terrain, op.cit*, p.109

In the building activities of Sawai Jai Singh, the structures of the Jaipur Observatory i.e. *Jantar-Mantar,* have prominent place. Out of the five astronomical observatories built by him at Delhi, Jaipur, Ujjain, Mathura and Benaras, only of Delhi and Jaipur still survived in good condition and popularly known as *Jantar-Mantar.* The Jaipur observatory, situated in the south-east of the Palace Complex[73], and consists of the huge masonry structures. Technical details and a precise appraisal of the scientific value of each instruments of this observatory do not come in the purview of the present work. The structures of only the most important instruments will be briefly described here.

Jai Singh claims to have devised some of the astronomical instruments such as the *Samrat-Yantra*, the *Jai-Prakash* and the *Ram-Yantra*[74]. The *Samrat-Yantra* is a huge equinoctial dial[75], consisting of a triangular gnomon with the hypotenuse parallel to the earth's axis[76], and on either side of the gnomon in a quadrant of a circle parallel to the plane of the equator[77]. Each edge of the quadrant is graduated in hours and minutes as well as degrees, and each edge of the gnomon has two scales of tangents. It is 90 feet high 47 feet long and radius of each quadrant is nearly 50 feet[78].

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[70] Jain, Shikha, "*Vaishnava Haveli Temples in Rajasthan: Original and Continuity of a Temple Typology",* paper presented in EASA Biennial Conference, July 2005, Also refer Asher Catherine (date), "Maping Hindu Muslim Identities through the Architecture of Shahjahanabad and Jaipur" in Beyond Turk and Hindu*: Rethinking Religious Identities in Islamic South Asia,* eds. D.Gilmartin and B. Lawrence, University of Florida Press, Gainesville, 2000, pp. 121-148, ibid, f. n. 23.

[71] Nath R., "*Sri Govinda Deva's itinerary from Vrindavan to Jayapura C.1534-1727*", in *Govinda Deva: A Dioogue in Stone,* edited by Margaret Case, (1996), N. Delhi: IGNCA Pub., p.178.

[72] Ashar, Catherene, *op.cit*, in D. Gilmartin and B. Lawrence (ed.) (2000) *Beyond Turk and Hindu: Rethinking Religioua Identities in Islamic South Asia*, Gainesville University of Florida Press, pp. 121-148, ibid, f. n. 25; cf. Shikha Jain, Princely Terrain, p.115.

[73] See Sketch Plan of the Palatial Complex.

[74] 'Preface' to the *Zij-i-Jadid Muhammad Shahi*, f.; cf. W. Hunter, "Some Account of the Astronomical Labour of Jayasinha of Ambhere or Jayapur", Journal of the Asiatic Society of Bengal, Vol.V, Calcutta, 1799 AD, ff. 177-221, Eng. Tr. of the 'Preface' or the Introduction to the *Zij-i-Jadid Muhammad Shahi,* ff.177-189; These three instruments are indeed peculiar to his observatories and to some extent attributed to his personal ingenuity. There is a manuscript of Sawai Jai Singh's time (no.31) in the Collection of *Pothikhana*, Jaipur which bears the title *"yantra-prakar"* or "the modes of

The *Jaiprakash* is a hemisphere[79] on the concave side of which are mapped out certain co-ordinates, cross wires are stretched north to south and east to west, and the shadows of the intersection of the wires falling on the surface of the hemisphere indicates the position of the sun in the Space; other celestial bodies can be observed directly by placing the eye at the proper graduated point and observing the passage of the body across the point of intersection of the wires. For this purpose the instrument is duplicated. It has a diameter of 17 feet and 5 inches[80]. The *Ram-Yantra* is a cylindrical instrument open at top and with a pillar at its centre[81]. The floor and the inside of the circular wall are graduated for altitude and azimuth observations. To facilitate observation the floor is broken up into 12 sectors[82]. The walls are also broken up and one section of the wall corresponds to one sector. On each side of the wall sections are notches in which sighting bars can be placed horizontally.

(constructing) astronomical instruments". It begins *"Atha Shrimaharajadhirajavirachit yantrami likhyate"* (now the mode of the instrument designed by the Maharadhiraj is described). Then as many as fifteen '*yantras*' (instruments) have been described. The words 'Shree maharajadhiraj kritani' may be interpreted as 'Maharaja' or 'Maha-rajadhirajen kritani' designed by the Kritani 'designed for the *Maharajadhiraj*. It is, therefore, possible that he might have designed some if not all of the instruments described in the manuscript (G.N. Bahura & Chandramani Singh, *Kachhwahas of Amber – The City of Mother Goddess*, Publication Scheme, Jaipur, 2009, pp.20, 22), but it can be inferred from his introduction to *Zij-i- Jadid Muhammad Shahi* that *Jayaprakash-Yantra, Rama-Yantra* and *Samrat-Yantra* were designed by him. As for as the nomenclature of these instruments are concern, G.N. Bahura suggests, "It appears that these were named after him, his great grand father Ram Singh-I and his guru the Samrat (Jagannat). In case of the *'Jayaprakash-Yantra'* it is also possible that it was named to commemorate his illustrious ancestor Mirza Raja Jai Singh, cf. Bahura, *Kachhwahas of Amber – The City of Mother Goddess*, p.22.

[75] See Plate No. 11 (B)

[76] See Plate No. 12 (B)

[77] See Plate No. 11 (A)

[78] At Delhi. it is 68 feet high, 125 feet from east to west and 113.5 feet from north to south, cf. Sarkar, Jadunath, *A History of Jaipur*, *op.cit*, p.214.

[79] See Plate No. 13 (A)

[80] At Delhi, it is 10 feet more; See plate; cf. Sarkar, *A History of Jaipur*, pp.214-15.

[81] See Plate No. 13 (C)

[82] At Delhi, it is divided into 30 sectors, *ibid*, p.115.

The *Digamsha-Yantra* or azimuth instrument is a small and useful device, consisting of a pillar surrounded by two circular walls[83]. Cross wires are stretched from the cardinal points on the outer wall, and both walls are graduated. The *Narivalaya-Yantra* is a cylindrical dial[84], the axis of the cylinder being horizontal and pointing north and south, and the northern and southern faces being parallel to the plane of the equator. There are also two meridian circles of different designs.

IV

Havelis were medieval mansions belonging to nobles who served the rulers, clearly demarcating themselves from the houses of the subordinates and common people. These mansions were symbols of the nobles' social status, and were next in hierarchy to the ruler's abode. These mansions were even visited by the ruler on some special occasions[85]. The many contemporary documents which refer to the constructions of these buildings, e.g. *Kapad Dwara* Map No.54 mentions the names of *havilis* or the houses of many prominent nobles and other persons with area allotted to for their houses in north of Talkatora Lake. The mansions of Jaipur range from the single courtyard house form to a complex of multiple courts[86]. The majority of the mansions have one or two courtyards. However, an increase in the status of the owner or in the number of family members resulted in an increase in either the scale of the mansion, or the number of courtyards. In Jaipur, the number of courtyards in a mansion may vary from 1 to 7. At times a single mansion with many courts, such as in the case of the 'Natani Haveli' in *Chhoti Chowpar*, or a complex like the 'Nawab-Ki-Haveli' in Tripolia Market could be classified as a cluster. It is difficult to differentiate the *haveli* from the cluster where the *haveli* complex itself is a cluster.

The location and the type of *haveli* or mansion were determined by the owner's social, political and financial conditions that is the caste, occupation and the relation with the ruler. This caste classification can be further validated by the fact that all mansions were named and recognized by the owner's name that also reflected his caste[87].

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[83] See Plate No. 13 (C)

[84] See Plate No. 14 (A)

[85] As evident from the *Siyah Huzur* of V.S.1790/1733 A.D. which mentions Sawai Jai Singh's visit to the newly built City of Jaipur and many places including *Brahmapuri*, Raja Ayamal's *Haveli*, etc.; Such other instance is described in the Hindi '*Raskapur*' (by Anand Sharma, Grandha Academy, New Delhi, 1995) where the wedding ceremony of the Jaipur ruler Jagat Singh with the daughter of Geejgad Thakur took place in the courtyard of Geejgad *Haveli* at Jaipur.

[86] See the relevant Plates showing buildings on the main streets of the walled City of Jaipur.

In the concentric plan of a courtyard type dwelling the centre of the spatial evolution is the centre of court. This initial central demarcation is evident even in the rural house form of Rajasthan region that gradually evolved into the single and double court *havelis*[88] in the course of time. The *haveli* plan evolved around the centre of the court with the court as the primary space. This is the essential core of a *haveli.* Secondary space evolved around these centers in various combinations of the *tibaris* and *chaubaras* as the needs of the inhabitants expanded with separate compartments for female (*zenana*), male (*mardana)* and servants. A hierarchical marking of the centre of these spaces is also maintained during festivals and ceremonies. Other sacred spots in the female section that were also marked were the *chulha* (cooking store), *puja* (meditation place) and *parinda* (water place). Besides, the central chambers (*chaubar* or *sal*) were enclosed by square shaped rooms in the corner used for storage called *kotha. Chandni* (literally means light) was an enclosure on the terrace with high walls and no roof used for sleeping in summer nights. The outer male section had a lavish *baithak* or a living space that was either for entertaining male guests or for conducting business[89].

The *haveli's* facades also follow centric rules regarding their composition; the facades developed from the inner court elevations to the outer court and the exterior, thus emphasizing the significance of the inner court. The facades follow the pattern of centric demarcation with the inner court centre corresponding to the centre in court elevations and finally expressed in the exterior elevation. The centers and sub-centers in the façade are emphasized by the placement of composite architecture elements. The compositions of the architectural elements are also centric in nature. The centre and sub-centers in the *haveli* plan are demarcated at every step in the façade irrespective of whether it corresponds to the central bay in the court elevations, the placement of an element that denotes the centre of an interior space, or the placement of niches inside the rooms[90]. The *haveli* facades are conceived from the inner court to the outer and exterior, with more emphasis on the treatment of the inner court facades. Since most celebrations and ceremonies were carried in the inner court it makes sense that the court façade should be most elaborate in this space[91].

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[87] For more details, see Shikha Jain's *Havelis : A Living Tradition of Rajasthan*, Gurgaon, 2004.

[88] Regarding the origin of the urban form of *haveli* or mansion and the *Chowks* or the square place, Shikha Jain is of the opinion that the origin of this urban form from the rural prototype is evident both in its form and etymological roots. The rural yard called '*Bara*' (literally, an enclosed opening in an agrarian dwelling to demarcate the territory) was the origin of the *'Chowk'* (court). Etymologically, *Chowk* is a Hindi term meaning 'a central space of gathering' at the level of city, the cluster and inside the *havelis*. In a Hindi dictionary one of the meanings of the term '*Chowk*' is *'Bada Vedi'* i.e. a big alter used for Vedic five rituals, thus indicating the ritual associations of this space. The significance of the *Chowk* as a ritual space is repeatedly expressed in the performance of all rituals conducted during the festivals, births, marriages and death ceremonies observed by the family. Although some of the families that have been residing in the *havelis* since centuries have changed the location of the kitchen, toilets, sleeping space, etc., the rituals are still performed in the centre of the courtyard, Shikha Jain, *Havelis : A Living Tradition of Rajasthan ,op.cit,* p.130

[89] In the traditional *havelis,* very few furniture pieces were kept inside the rooms and they are more or less a by-product of the plot and the courtyard and were used as convenient, ibid.

Other Buildings within the city walls: A definite hierarchy of temples and wells (both constituting ritual spaces) can further be found inside the *Chowkries* or blocks in the layout of the *mohallas* or localities. Jaipur, in course of time became famous as 'a city of temples'. According to an estimate[92], there are today more than one thousands temples of various sizes in Jaipur City. But the number of temples in the beginning was not so large[93]. In fact, Jai Singh himself had, besides the *Govind-Devaji* Temple, built some other important temples, such as, the temples of *Kalkaji, Gopinathji, Visheshwarji* and *Sitapati*[94]. As his main interest in later days was in *Vaishnavism*, Jai Singh had been able

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[90] This is clearly expressed in the street elevations of the corner *haveli* of Pandit Shivdin in *Chowkri* Modikhana.

[91] Shikha Jain suggests that in the *havelis*, a super imposition of the ritual centre with the physical centre and topographical centre in the inner female court establishes the locus around which the built form and owner's life revolves. It is a deviation in this super imposition that induced a shift in the locus when the house transformed from the courtyard type to the bungalow. This can be observed in the Chaumoo Thakiur's *haveli* near 'Zorawar Singh gate' and the later bungalow type called the *Chaumoo House* that is situated on the outskirts of Jaipur, cf. Sikha Jain, *Havelis : A Living Tradition of Rajasthan, op.cit*, p.132.

[92] Cf. Roy, A.K., *A History of the Jaipur City*, p.55.

[93] It is not possible to give the exact number of temples in the city. Many temples are situated in the residential buildings and some times one building contains temple dedicated to various gods, but temples, most of them with in the city walls were registered for grants etc. with the *Devasthan* Dept. in 1973, Roy, A.K., *History of the Jaipur City, op.cit*, f.n.47, p.5.

[94] According to the author of '*Jaivamsha Mahakavya*', Sawai Jai Singh may be regarded as a true lover of art who was deeply interested in the art of architecture, and the temple constructed during his time by him are the living monuments of his love for constructive art. The poet describes the city of Jaipur crowded with these temples as the Capital of heaven called "Indraloka", he says, "He (Jai Singh) constructed a number of temples and religious places that his name is next to none among the Princes of the State of Rajasthan. The temples of *Gopinath, Vishweshwar, Kalki* and *Govind Devji* at Jaipur still perpetuate his memory in the heart of the people", cf. Sawai Jai Singh in "Jaivamsh Mahakavya", *Journal of Rajasthan Institute of Historical Researches,* Vol.18, 1980, p.16.

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to attract to his City practically all sects of *Vaishnavas.* Most of the temples inside the city were built in the *shikharless*, *haveli*-temple style.

The outer side of the buildings facing towards on the main roads is painted in pink colour, which from a distance looks very pleasing, especially during the rains, and in the twilight when it acquires a golden hue. Due to this feature of the buildings on the main roads, the walled City of Jaipur is popularly known as the 'Pink City'. There is a debate among the historians of Jaipur, about whether this pink colour was originally done during the period of Sawai Jai Singh or it was a later addition.

Some historians are of the opinion that the city was originally painted with cream or white colour.[95] Tillotson has taken a balanced view of the debate, as he mentions[96] that this theory is plausible as it suggests a continuation of the practice found at Amber; and certainly some of the buildings in the city, including most notably. The *Chandra-Mahal* (the main block of the Palace), are now cream and may always have been so. But the only evidence ever advanced in support of the theory is the alleged description of the city as white by Joseph Tieffenthaler (who visited Jaipur soon after its completion) and a description of the *Hawa-Mahal* as white in a contemporary poem[97], and this will not do: The latter can be put down to poetic idealization, and the abused Tieffenthaler made no such remark- he does not refer to the colour of the city at all[98]. It is probable that the pink wash on the principal bazaars and the city walls is original. The earliest known paintings of Jaipur, from the reign of Maharaja Sawai Ishwari Singh

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[95] See, for example, Satish Davar, "A filigree city spun out of nothingness", Marg Vol.XXX, No.4 (Sept.1977), pp.35-58, p.57. The issue of the original colour of Jaipur is discussed by Yadvendra Sahai, *'Pink City': Its original colour and allied problem; Cultural contour of India*, ed. Vijay Shankar Srivastava (New Delhi, 1981), pp.396-400; Another account of the theory that the City was changed from cream to pink is given by Michael Carapetian, "Jaipur: The Pink City", *The Architectural Review*, Vol.CLXXII, No.1027 (Sept.1982), pp.35/9-43/9, p.42/9, n.4. Curapetian writers: 'An alternative view is that the city was originally painted light cream. But later in order to reduce the glare, Jai Singh's successor Man Singh-II experimented by painting parts of the city different colour, finally choosing pink for the whole city. This account is inaccurate. Man Singh–II ruled from 1922 to 1949 (d.1970); The experiment described was under taken by Ram Singh-II (1835-80) in 1868 but the colour pink was not than 'finally' chosen but rather restored after the experiment (see Sahai, *op.cit*, p.398), Tillotson, *The Rajput Palaces: The development of an Architectural Style*, *op.cit*, f.n.7, p.169; A.K. Roy is also of the opinion that the pink colour for the walled city was chosen by Ram Singh-II after many experiments. A.K. Roy, *A History of the Jaipur City*, *op.cit.*

[96] *Tillotson, The Rajput Palaces: The development of an Architectural Style, op.cit, p.169.*

[97] See Sahai, *The Rajput Palaces: The development of an Architectural Style*, *op.cit*, p.397.

[98] See Tieffenthaler, *op.cit*, pp.314-18.

(1743-50), Jai Singh's son and immediate successor, depict pink buildings[99]. And the city walls are very similar in design to the walls of the Mughal Red Forts of Agra and Delhi, so much so that it is evident that the architects intended to create a similar effect,, it is more likely than not, therefore, that the similarity in colour is a part of that original intention.[100]

V

Besides the building inside the city of Jaipur, Sawai Jai Singh was also responsible for the construction of numerous buildings in the out skirts of the walled city, such as, forts, palaces, temples, dam, artificial lakes, *baolis* or step-wells, etc., and many *carvan sarais* and other buildings at different places. Among these were *Jal Mahal* or the Water Palace, *Sisodia Rani Mahal*, many hill-forts, such as, *Jaigarh*, *Nahargarh*, *Raghunathgarh* and *Ambhagarh*, the Sun Temple[101] at the pilgrimage-site of *Galta* in the east of the Jaipur City. Jai Singh also provided Sanganer (about 11 kms south of Jaipur) with a protective wall, and built a few temples and palaces and *Puras* or forts out side Jaipur[102]. *Caravan-Sarais* for travelers were built not just in his domains, but also in other provinces, as an act of charity[103].

To the north-east of the City, a number of buildings were constructed on the road to Amber, of which the most important is the *Jal-Mahal*[104]. It was a pleasure palace built, in the middle of the artificial lake, *Man-Sagar*[105], by Jai Singh in 1735 A.D.[106] *Jal-Mahal* is a large building built on a square plan, though made of rubble without any carving or use of marble. The sub-structure of the palace consists of a number of arcaded rooms which generally remain immersed in water. Placed at the corners of the square shaped buildings are elegant *Chhatris* or the pillared verandahs, while four large curvilinear (*Bangadar*) *Chhatriss* rise gracefully in the centre of all four sides. These and the arrangement of the arcaded galleries and of the double stairs with pillars lead to the top storey.

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[99] Ibid, p.169.

[101] This temple was built by Rao Kripa Ram, Jai Singh's representative at Delhi, TIllotson, *The Rajput Palaces: The development of an Architectural Style*, *op.cit*, p.76: Shikha Jain, *Princely Terrain*, *op.cit*, p.181.

[102] At Agra, he built *Jaisingh Ghera*, a protective wall and at Mathura he is said to have built a temple dedicated to *Sitaram*, and another temple dedicated to *Govardhan* at Govardhan (Mathura), at the same place be also built *Jaisingh Pura* and a protective wall., V.S. Bhatnagar, *Life and Times of Sawai Jai Singh*, *op.cit*, p.181.

[103] According to Jonathan Scott, who write his work in 1786, Jai Singh erected "a Caravan Sarai and market in every province of Hindustan for the convenience of the travelers at his own expense", cf. V.S. Bhatnagar, *Life and Times of Sawai Jai Singh*, p.396.

[104] See Plate No. 25 (A)

[105] See Plate No. 24 (B)

[106] *Dastur Kaumwar* (Jaipur), Vol.23, V.S.1792/1735 AD, ff. 2, 42, 285, Jaipur Records, R.S.A., Bikaner; This building was completed later on by Jai Singh;s son and his second successor, Madho Singh.

To the south-east, on the Agra road, 'Sisodia Rani Mahal', is existed. It was a palace built for the Mewari wife of Sawai Jai Singh. This palace was built by Jai Singh himself but later on completed by his son Madho Singh. Comparing with the *Sabh-Niwas* and the palace garden, these buildings follow conventional Rajput design, but it is uninspired. As in the *Chandra-Mahal*, the symmetry of plan and massing is the dominant features, and again a somewhat gratuitous one: it robs the buildings of that traditional Rajput picturesque interest and does not succeed in imbuing them with the harmony and elegance of more carefully calculated proportions. In addition, some of the architectural features have been made redundant: in earlier Rajput buildings the *Chhattris* and *Bangaldar* roofs are integral parts of the composition, but in these buildings such forms are decoratively sprinkled over the top of a dull regular block. A vocabulary of forms has become a repertoire of decorations, and not a very broad one at that[107].

Defense line of the City: To protect the new Capital City of Jaipur, some forts such as Nahargarh, Ambagarh, Raghunathgarh, Moti Dungri, Hathroi and Ganeshgarh were built on the hillocks around the City. These fortifications in turn ensure a complete enclosure of the City, at least from three sides. The existing forts of Ambagarh and Nahar Singh Bhoomiya continued to serve as watch posts to guard the Gateways to the Amber State which is known as the "Purana-Ghat". All towns east of *Dhoondhar* were connected with the Capital City of Jaipur through the *Purana-Ghat* area, which was later known as the "Ghat-Ki-Guni".

The succession of Sawai Jai Singh marks a new era in the history of the *Dhoondhar* State and the influence of Amber State extended up to Bundi in the South and this availed the South side of Amber with sufficient security for Sawai Jai Singh to shift his Capital from Amber to a new site in the vast plains to the south of hills of Amber. The historic Agra- Ajmer highway emerging from the *Ghat-Ki-Guni* served as the southern edge of the walled town of Jaipur. With the foundation of Jaipur, the importance of *Ghat-*

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[107] Tillotson, *The Rajput Palaces: The development of an Architectural Style*, *Op.cit*, pp.181-182.

Ki-Guni was further increased, the site not only served as the gateway to the State but also as the location of a number of pleasure gardens. As the valley line of the *Purana Ghat* was deep and surrounded by green hillocks which provided a cool and shaded environment, Jai Singh chose the site to build summer palaces, gardens with water channels, garden *havelis* and garden temples, were added to the *Ghat-Ki-Guni.* The architecture of many of the present structures suggests that they were constructed during the 18th Century.

Grand gardens with central water channels were laid on the symmetrical *Charbagh* or the square pattern. The *Sisodia-Rani Palace* and garden was built by Sawai Jai Singh in the most picturesque location at the eastern end of the *Purana-Ghat* for his queen from the Sisodia family Udaipur. *Vidyadhar-Ka-Bagh* was another lengthy garden laid by Vidyadhar Rao, the town planner and a minister of Jaipur. It is said that Vidyadhar and his family lived in the adjoining palace named *Pila-Mahal.* The *Rajniwas* and *Roop-Niwas* gardens and their small palaces feature amongst the other remarkable structures built during Sawai Jai Singh's reign. He is also credited with the revival of the *Galta Tank*[108] through the construction and restoration of many temples near the sacred tank and on its approach. In fact, the *Galta* hill became the major focal point of the town of Jaipur when a Sun temple was constructed by the founder of Jaipur on the top of the hill and a major axis (east-west axis) of the grid-iron layout of the town of Jaipur was aligned with the Sun temple on the *Galta* hill and the eastern gate of the walled town facing the *Galta* hill was named as *Surajpol* after the Sun Temple.

There are some beautiful but abandoned *havelis* in *Ghat-Ki-Guni*, such as, the *Lohri-Haveli*, *Saraf-Haveli* and *Mahant-Haveli*, which belong to a unique building type of tiered garden *havelis* adhering to symmetrical and axial planning. The street space within the valley too has a tremendous sense of enclosure and high visual quality with pavilion, arcades, and colonnades living in the street and punctuated by gates. In many respects, the complex presents the basic principles of architecture. The facades of the structures are symmetrical and contain architectural elements showing definite rhythm & harmony.

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[108] Its water has some medicinal qualities and it is the general belief that people get rid of many diseases after taking bath in it.

The complex depicts the use of all architectural elements of Rajputana architecture including the *Bengaldar* roof, domes, twin columns, trefoil and cusped arches, wide eaves and brackets with materials as used in the city of Jaipur. The city has a vast tradition of decoration achieved through the skillful use of lime in various way- It also incorporates finishes such as *loi, araish, khamira, dar*, stucco and decoration finishes with mirror work, *dakmeena*, mother of pearls inlay, silver inlay and stained glass.

Jaigarh[109] is situated about 3 kilometers from north to south and 1 kilometer from east to west. It has three approach gates- the *'Awani Gate'* constructed in the 16th Century to connect the fort to the Amber palace below, the *'Sagari Gate'* that had originally served as the main entrance to Jaigarh fort and is located towards the lake *Sagar* and the *'Doon Gate'*[110]. All the approach gates are linked to *'Jaleb-Chowk'*, the huge courtyard which has two long galleries on either side[111]. The fort contains the seven-storied *'Diwa-Burj'* from which signals could be sent to the fire watch towers on fortified outer-walls enclosing the entirety of the Amber complex. The *'Subhat-Niwas'*, inside Jaigarh's Palace, is an 18 pillared hall that is open from three sides. This structure was meant for addressing the soldiers and is connected to the *'Khilbat-Niwas'*, the hall of private audience where the rulers met their ministers, generals and other confidantes. Another building, the '*Laxmi-Niwas*' Palace, was constructed by Mirza Raja Jai Singh and was subsequently further added to during the reigns of Sawai Jai Singh and Ram Singh-II. This building has a specific 'system of central heating'[112].

The fortress ('*Lalit-Mahal*') complex contains a 'theatre' designed for the performance of the traditional puppet shows of Rajputana. A 295 long feet passage connects the '*Laxmi-Vilas*' Palace and the puppet theatre, and there are numerous underground passages or 'tunnels' linking every part of the fort, as there was a strategic requirement during those days as the fortress could be subject to attack at any time. Situated between the puppet theatre and the *'Surya-Mahal'* are the old *'Zenana'* or the female apartments and *'Ranawat-Chowk'* constructed in the 11th Century, these structures are the oldest buildings in the fort. Initially, the royal court or durbar was held in the *Ranawat-Chowk*, while the *'Vijayagarh'* structure was used as an armoury[113].

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[109] Vidyadhar was awarded in 1726 A.D. for completing repair and construction works at Jaigarh, *Sawai Jai Singh Charit*, ed. by G.N. Bahura, City Palace, Jaipur, 1979, p.133; cf. Shikha Jain (ed.), *Princely Terrain*, p.45; Associated with Amber, and perched on the highest ridge of the Amber- Jaipur hills, stands the fort of Jaigarh. It is believed that Kakil Dev, the first *Kachhwaha* ruler to hold Amber after taking over the area from the *Meenas*, laid the foundation of a fort at *Chilka-Tola* in A.D.1036. This *Chilka-Tola* seems to have been the pre-runner of the present Jaigarh fort. Prior to the time of Sawai Jai Singh, *Chilka-Tola* was also referred to simply as 'Amber fort', after the name of the Capital town of Amber. It was Sawai Jai Singh who added a few palaces and other building with in the fort and renamed it *'Jaigarh'*.

[110] It was constructed by Maharaja Man Singh-II in 1942 AD.

[111] Up until the 16th C., these galleries were used as stables, later they served as garages for cannons.

[112] It is being dealt in a separate chapter on water management system.

Jaigarh is also known for a very elaborate and significant system of rain-water conservation & management having water channels made of lime mortar, bricks & stones[114], and a number of open and covered tanks[115]. The largest tank with in the fort is 158 feet wide and 40 feet deep[116]. Amber's 'Sagar' Lake[117] and other small dams also supplemented the water provided by these sources, thus ensuring that the inhabitants of the fort had adequate water for their needs.

At a small distance from Jaigarh, on the top of the hills to the North-West of Jaipur City is the fort of 'Nahargarh' or the 'Tiger Fort'[118]. This fort is about 500 feet high from the foot of the hills. This fort was initially known as 'Sudarshangarh' after god Krishna[119]. Sawai Jai Singh built a large part of Nahargarh shortly after the foundation of Jaipur and completed it in 1734 A.D[120]. This fort was constructed at a cost of about Rs.3.5 lakhs[121]. Jaigarh was the only fort of the *Kachhwahas* rulers, which during the time of the Mughal rule had become so large as to accommodate a big army[122]. Nahargarh Palace-Complex is a maze of terraces and courtyards and contains separate chambers built for nine maharanis, most of which are painted with floral designs and have beautiful stained glass windows. Nahargarh also have some water bodies – tanks[123], *baolis* or step-wells beautifully designed[124].

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[113] Shikha Jain (ed.), *Princely Terrain*, p.46; It is said that Man Singh-I, the commander of the Mughal Emperor Akbar's army, picked up technical know-how regarding the 'casting of cannon' while serving in Kabul. He brought this knowledge to Amber, and his father Bhagwandas, who was then the ruler of Amber, constructed a 'local gun foundry' (See Plate No. 23 (A)) in 1584. The earliest cannons to be found inside the fort date to 1587. The gun foundry at Jaigarh fort comprises of a 'furnace' and a 'drilling complex', and covers and area of 162 feet by 57 feet. The cannon named *Jaivana* (See Plate No. 23 (B)), was constructed in 1720 at the gun foundry of Jaigarh. The *Jaivana* is reported to be the 'biggest cannon on wheels in Asia'- its barrel is 20 feet long and it weigh approximately 50 tons and is one of the main attraction for the visitors to the fort (According to local lore, the cannon has actually been fired once as trial, a statement corroborated by a indications to that effect on the barrel of the cannon).

[114] See Plate Nos. 26 & 27.

[115] For details, see the chapter on 'Water Management System'.

[116] See Plate No. 28 (A)

[117] See Plate No. 28 (B)

[118] See Plate No. 23 (C)

[119] Khangart, R.S., *Jaigarh: The Invincible Fort of Amber*, Jaipur, 1990, p.27; Although originally called Sudarshangarh, the fort came to be known as Nahargarh because it is said, 'the ghost of one Nahar Singh had to be appeased before it could be constructed, cf. Shikha Jain (ed.), *Princely Terrain*, p.47.

[120] Ibid, p.25; P.V. Begde, *Forts and Palaces of India*, p.127; cf. V.S. Bhatnagar, *Life and Times of Sawai Jai Singh*, *Op.cit*, p.298; also cf. R.L. Mishra, *The Forts of Rajasthan*, p.34.

[121] Gehlot, J.S., *Rajasthan Ka Itihas*, *Op.cit*, p.396; Additions to the fort were made from time to time by subsequent ruler, particularly Madho Singh-II, who built seven of the nine palace buildings there (Shikha Jain (ed.), *Princely Terrain*, *Op.cit*, p.47). Later the fort was renovated by Maharaja Ram

If the forts of Nahargarh and Jaigarh are compared, it can be observed that the palaces and other buildings of these two forts are quite different from each other. The outer walls in Nahargarh are lower in height and less in breadth than the walls of Jaigarh. The entrance gates of the palace, the quadrangle, the circular domes and towers, the paintings on walls and ceiling in the Nahargarh Fort are typically in Mughal-Rajput style. The palaces of *Suraj-Prakash*, *Khushal-Prakash*, *Jawahar-Prakash*, *Anand-Prakash*, *Laxmi-Prakash*, *Ratan-Prakash* and *Vasant-Prakash* in the Nahargarh fort have the impact of the Mughal architecture[125]. The palace complex in the Jaigarh fort consisting of *Subhat-Niwas, Khilbat-Niwas, Laxmi-Niwas, Surya-Mandir, Vilas-Mandir, Aram-Mandir,* etc. shows no Mughal influence on the general architecture. They are basically Indian (Hindu) in Style and nature. This only proves that Jaigarh was constructed much before the establishment of the Mughal rule in India.

Besides the above mentioned buildings, '*Raghunathgarh*' and '*Ambagarh*', two fortresses to the north and south of the Sun temple built by Rao Kripa Ram (Jai Singh's representative at Delhi) on the ascent to the *Galta*, are attributed to Sawai Jai Singh.

Singh (1835-1880), about 100 years after it was built (Khangarot, *Jaigarh: The Invinsible Fort of Amber*, *Op.cit,* p.25). The *Madhovilas Bhavan* or Palace was added by Maharaja Madho Singh in the 19th Century cf. Shikha Jain (ed.), *Princely Terrain*, *Op.cit*, p.27.

[122] Khangarot, R.S., *Jaigarh: The Invincible Fort of Amber, Op.cit,* p.27; According to Khangarot Jai Singh army was about 30,000 soldiers, but Captain J. Pillate estimated it as 75,000 horsemen, and G.N. Bahura suggests that the total army of Sawai Jai Singh's State was about 50,000, cf. G.N. Bahura, *Catalogue of the Historical Documents at the Kapad-dwara, Jaipur*, Vol.I. *Op.cit.*

[123] See Plate No. 30- (A) & (C).

[124] See Plate No. 30- (B) & (D).

[125] There is temptation to account for the Mughal influence, on Jaipur School of architecture, by referring to the long and close association between the Amber State and the Mughal Emperors, an association established by Sawai Jai Singh's ancestor Raja Bharmal, which continued for almost two hundred years. But such a reference to political relations on its own is insufficient to account for the cultural influence. It does not explain, for example, why the marked degree of political influence evident in the Jaipur *Sabha-Niwas* was reached so late. For this first really overwhelming influence of Mughal architecture on the Rajput school- indeed it is not an influence so much as an abandonment of the Rajput style and a whole sale adoption of the Mughal Empire[125]. This suggests that the introduction of Mughal ideas was in fact due less to political relations then to the movement of craftsmen.

Though a Jain, Rao Kripa Ram is said to have built no less than seven temples dedicated to Sun[126].

VI

The records of the Building Department show that building material was to be delivered to Vidyadhar and Rai Sheonath, another minister of Jai Singh.[127], and another Jaipur Record shows that Saheb Ram was the in-charge of the building material collection and its transportation.[128]. In the construction of the buildings of the Jaipur City, in place of dressed stones, rubble was used as the main building material. The local stone, including that of the hills immediately around Jaipur, is grey and unattractive. The rich red and easily workable sand-stone used to such splendid effect in many Rajput capitals, especially Jodhpur, and in the Mughal capitals, is not found near Jaipur[129], and building an entire city at once using imported stone would have proved very expensive. Thus the reason behind using rubble as building material was its inexpensiveness and Jai Singh's desire to build the City quickly. Furthermore, the use of a rusty pink rather than cream paint over the rubble masonry meant that a passable imitation of the dressed red-sand stone could be created at a fraction of the cost[130]. Regarding the building material used in the City, a French scholar Victor Jacquemont (c.1832) who gave the finest early European account of the Jaipur City, says,

> "The ordinary houses have been built with the stone of the hillocks around the houses of a higher rank, built of the same materials, are plastered with a lime cement of brilliant whiteness. The cement is some times polished like stucco. Most of the temples and palaces have facings of white marble. There is no hut, no ruined building, and no rubbish heap. The City has the look of what it really is, an entirely new town, which has not yet been subjected to the horrors of war. In general, the architecture of Jaipur is of a very elegant style."[131]

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[126] Cf. Bhatnanagar, V.S., *Life and Times of Sawai Jai Singh,* p.336, f. n. 64.

[127] *Siyah-Imarat* (Jaipur), *Bhadra Sudi* 3, V.S.1793/1736 AD, Jaipur Records, R.S.A., Bikaner.

[128] *Dol* (Jaipurr), *Posh Vadi* 1, V.S.1784/1727 A.D, Jaipur Records, R.S.A., Bikaner.

[129] The palace of Amber is mostly built of the local stone, rendered and painted cream, though some individual parts of the palace are built of higher quality, imported stone: the *Diwan-i-Am* is built of red sand stone and the *Jai Mandir* of white marble.

[130] Tillotson, GHR, *The Rajput Palaces: The development of an Architectural Style, 1450-1750,* Delhi, 1987, pp.168-169.

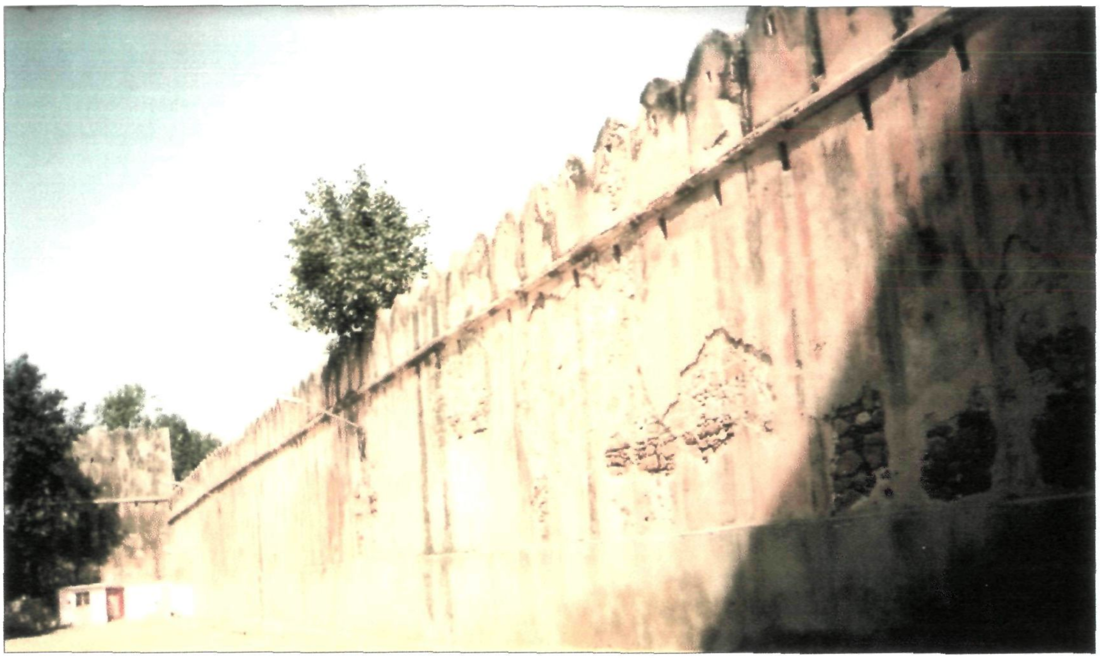
[131] Jadunath Sarkar, *A History of Jaipur*, Hyderabad, 1984, *op.cit.*, p.208.

PLATE- 2

(A) An Aerial view of the Jaipur City from the Nahargarh Fort

(B) The east-west axis-road (Chandpol to Surajapol), Jaipur

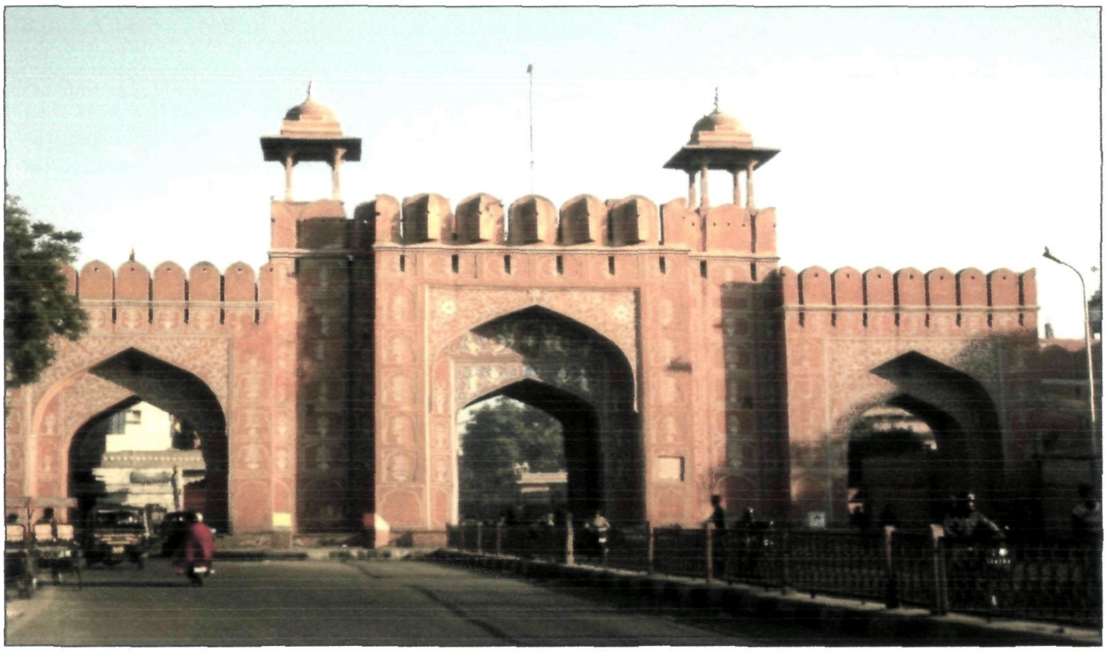
PLATE- 3



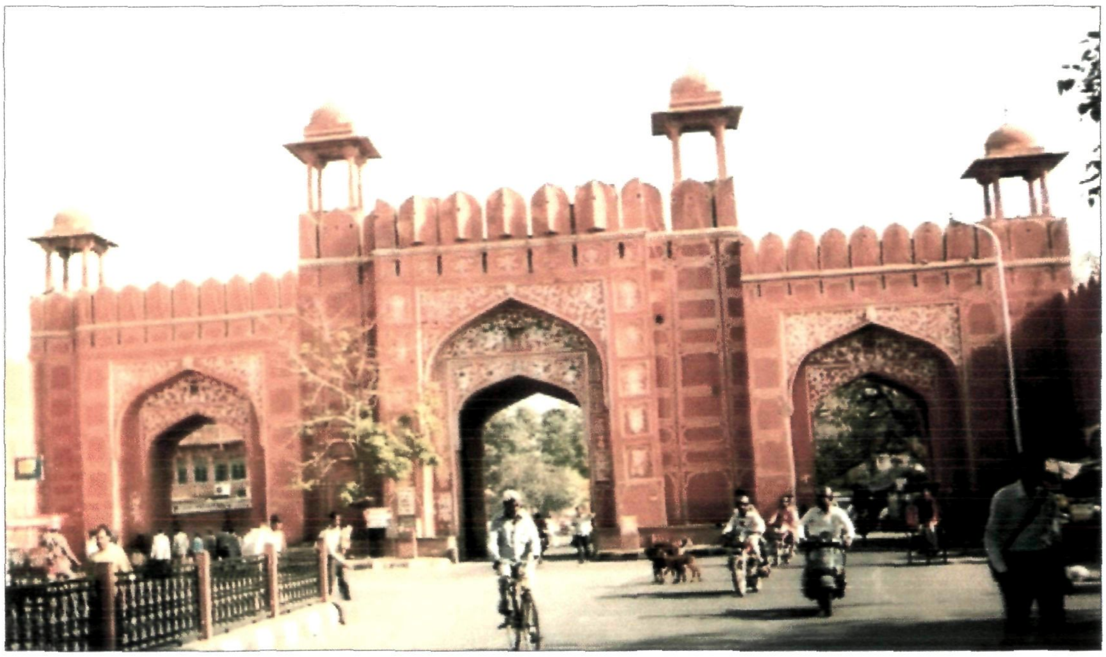
(A) South-eastern section of the city-wall, Jaipur

(B) The south-western corner bastions of the city wall, Jaipur

PLATE- 4

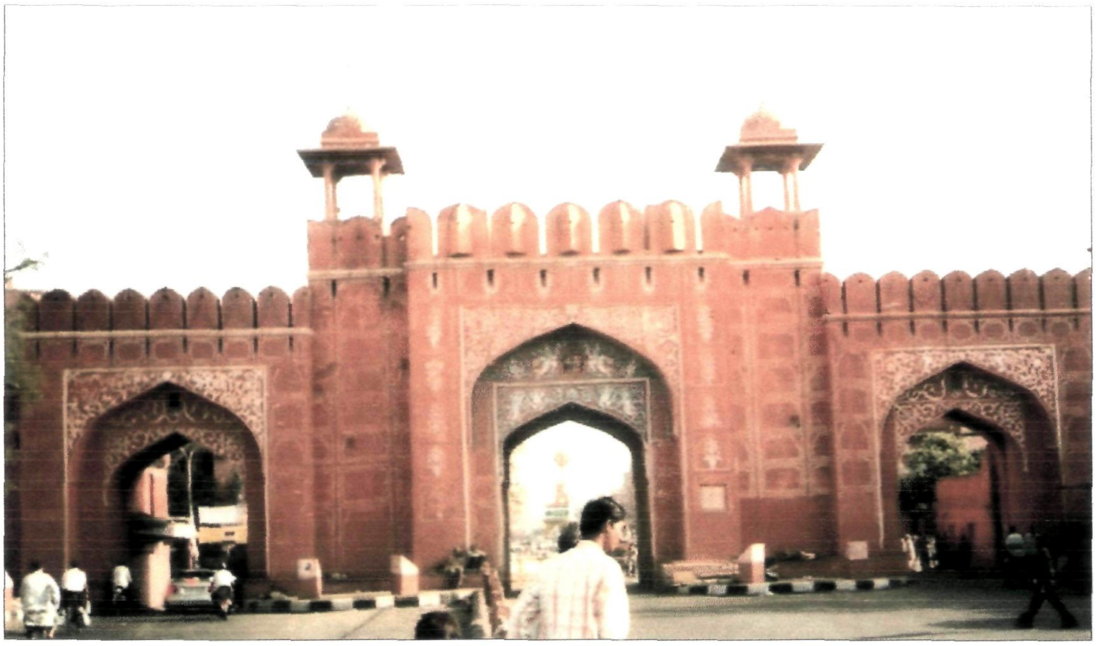


(A) Rampol or the Ghat-Darwaza, (south-eastern gate), Jaipur

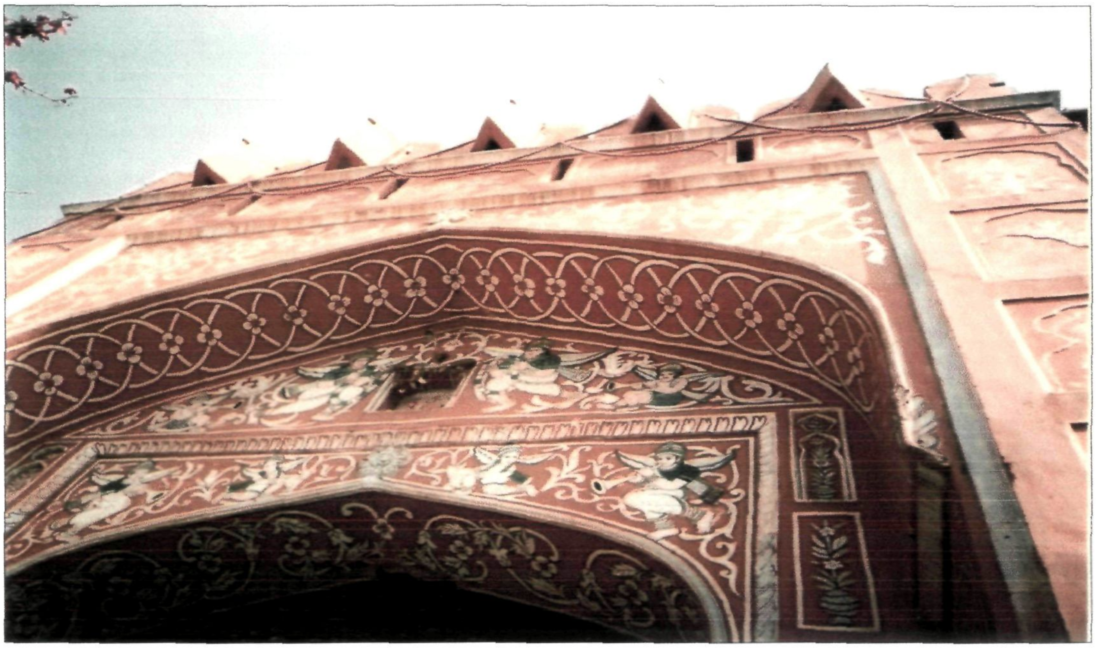


(B) Shivpol or the Sanganeri Gate (southern gate), Jaipur

PLATE- 5

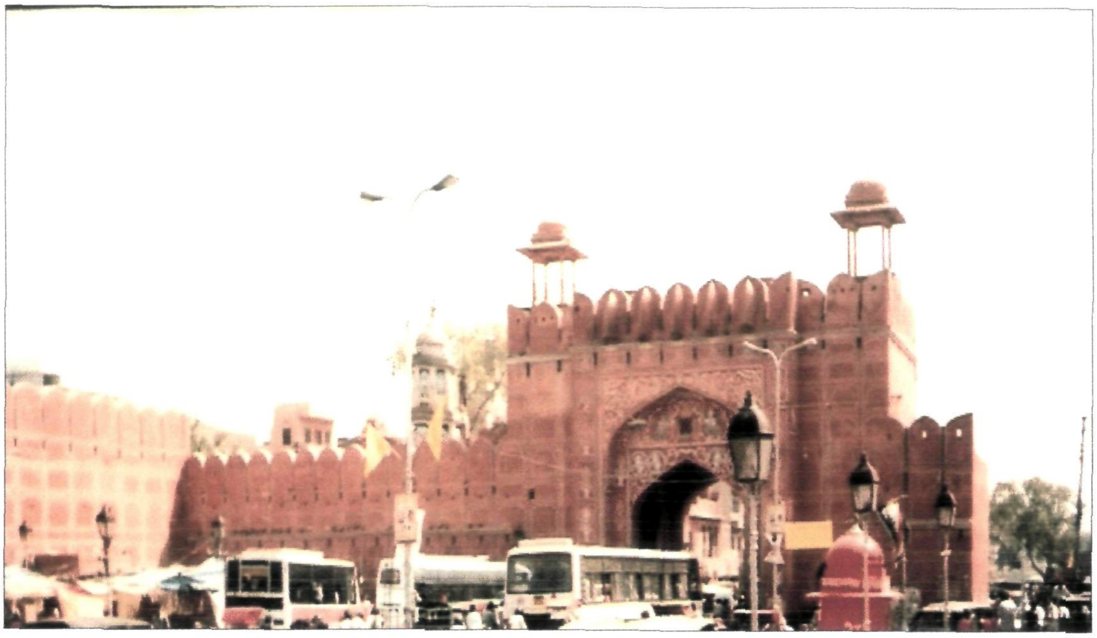


(A) Kishanpol or the Ajmeri Gate (south-western gate), Jaipur

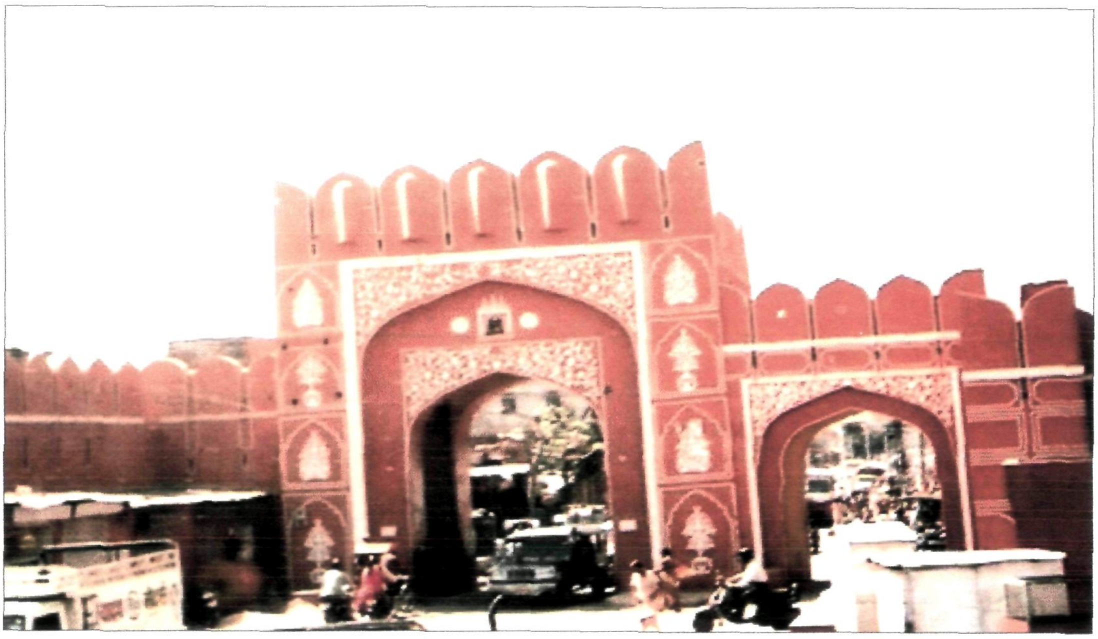


(B) A closer view of the Ajmeri Gate, Jaipur

PLATE- 6

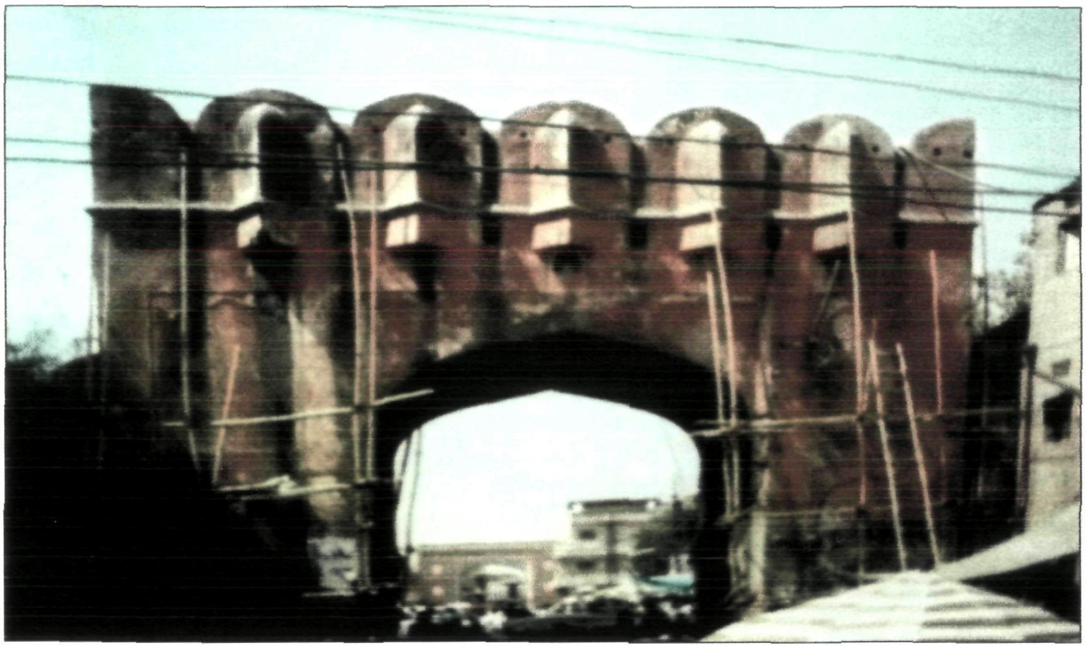


(A) Chandpol or the Moon Gate (western gate), Jaipur

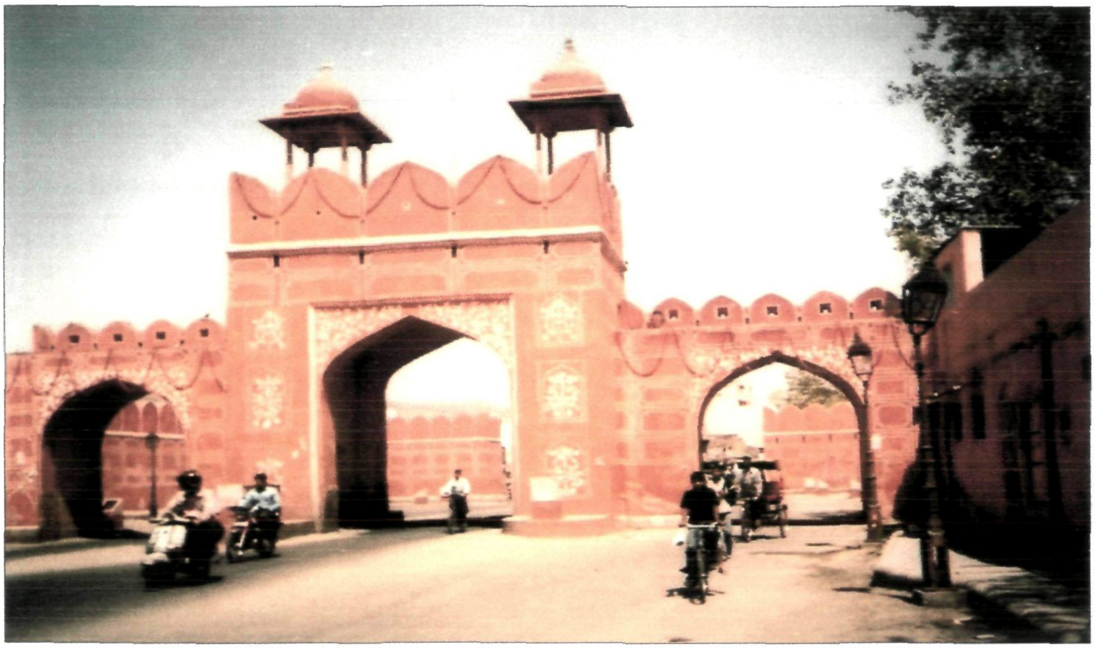


(B) Surajpol or the Sun Gate (eastern gate), Jaipur

PLATE- 7

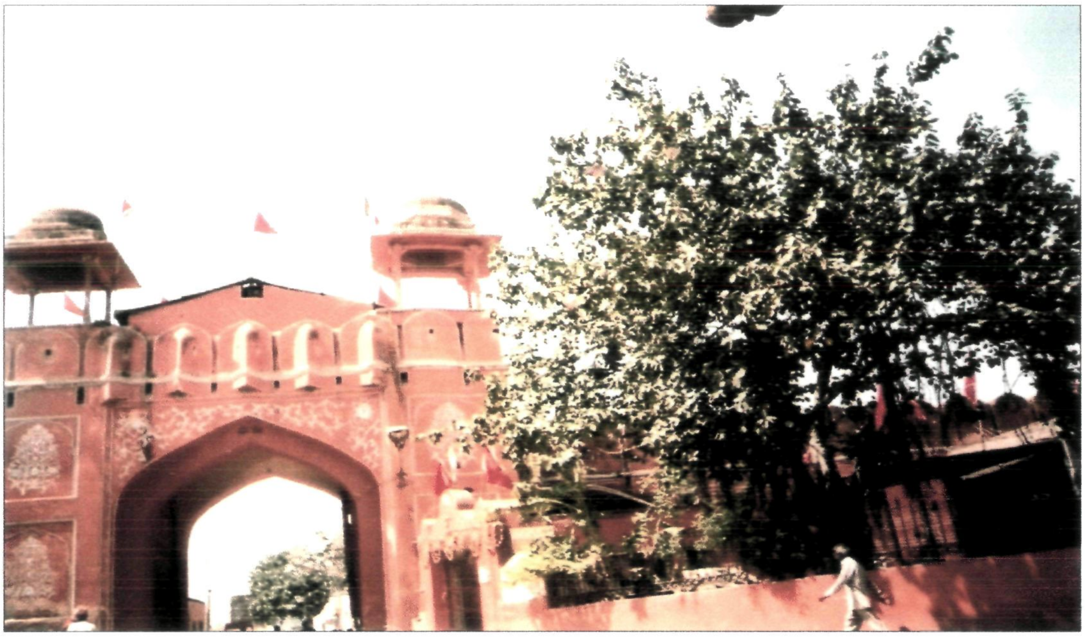


(A) Samrat Gate (north-western gate), Jaipur

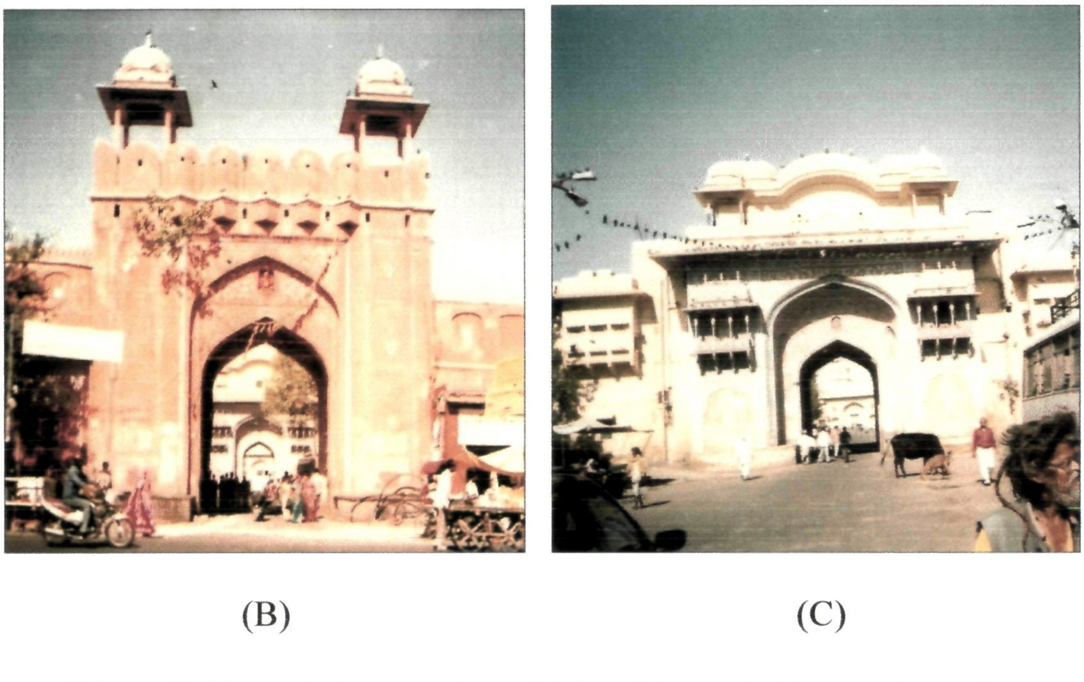


(B) Dhruvpol or the Zorawar Singh Gate (northern gate), Jaipur

PLATE- 8



(A) Gangapol or the Mathura Gate (north-eastern gate), Jaipur



(B) (C)

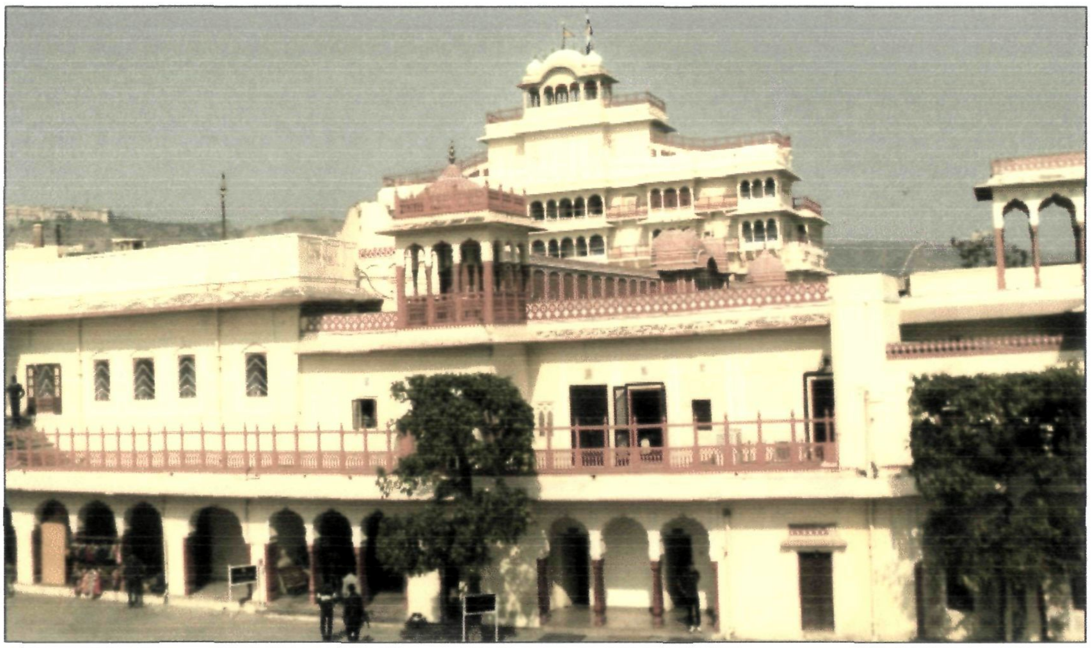
(B) Sireh-Deorhi Gate and (C) Nakkar-Darwaja, Palace Complex

PLATE- 9

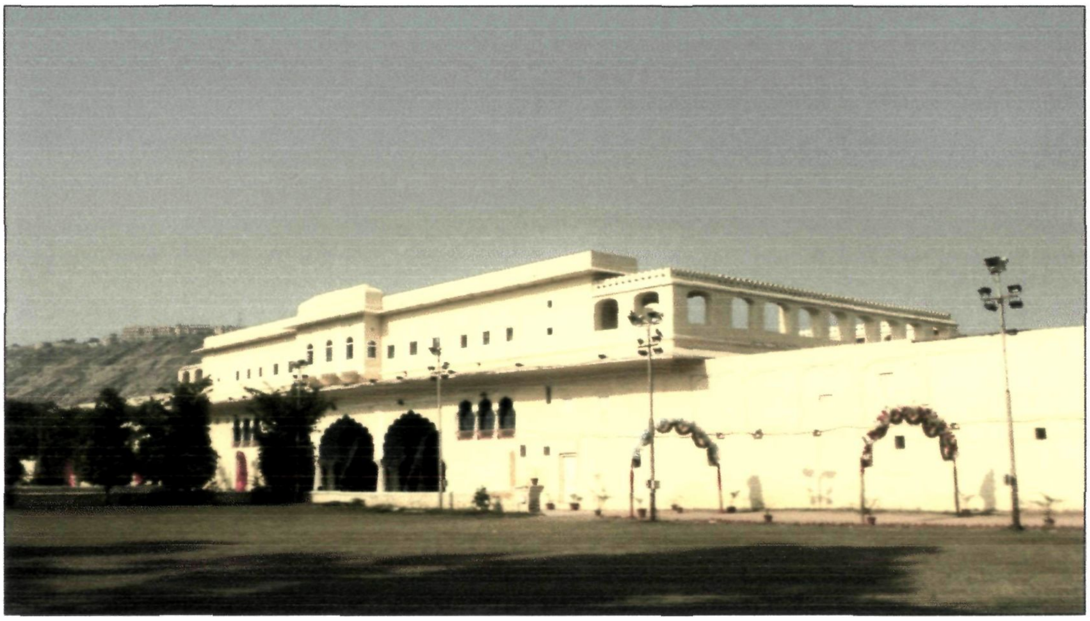
(A) Gateway to the City Palace, Jaipur

(B)Diwan-i-Am, Palace Complex, Jaipur

PLATE- 10

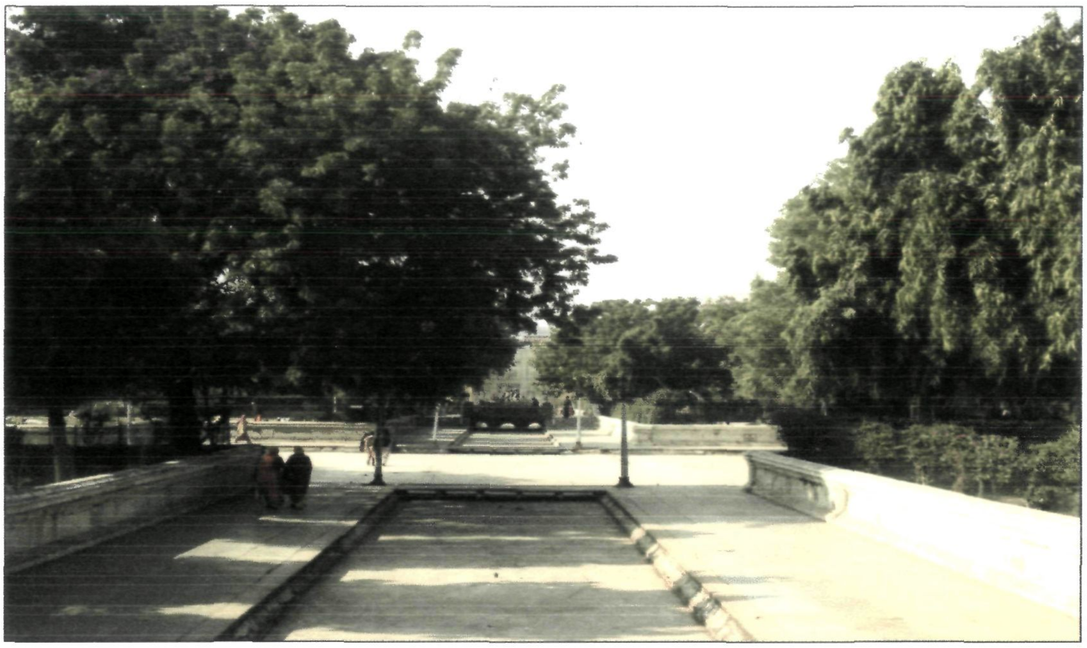


(A) Southern view of the Chandra-Mahal, Palace Complex, Jaipur

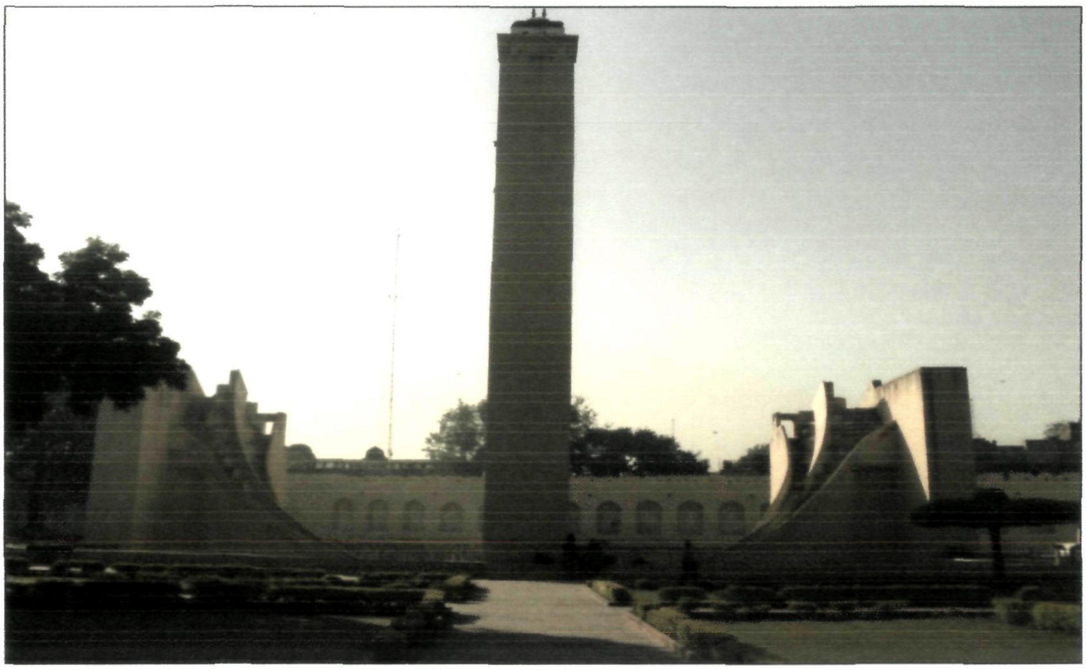


(B) Badal-Mahal or the Cloud Palace, Palace Complex, Jaipur

PLATE- 11

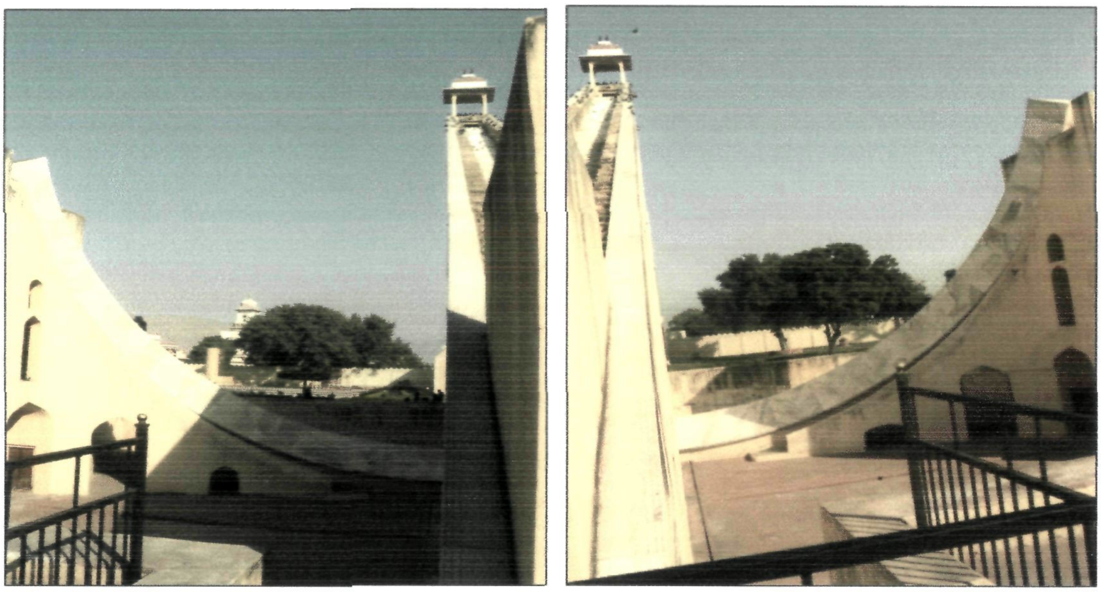


(A) Jainiwas Garden, Palace Complex, Jaipur



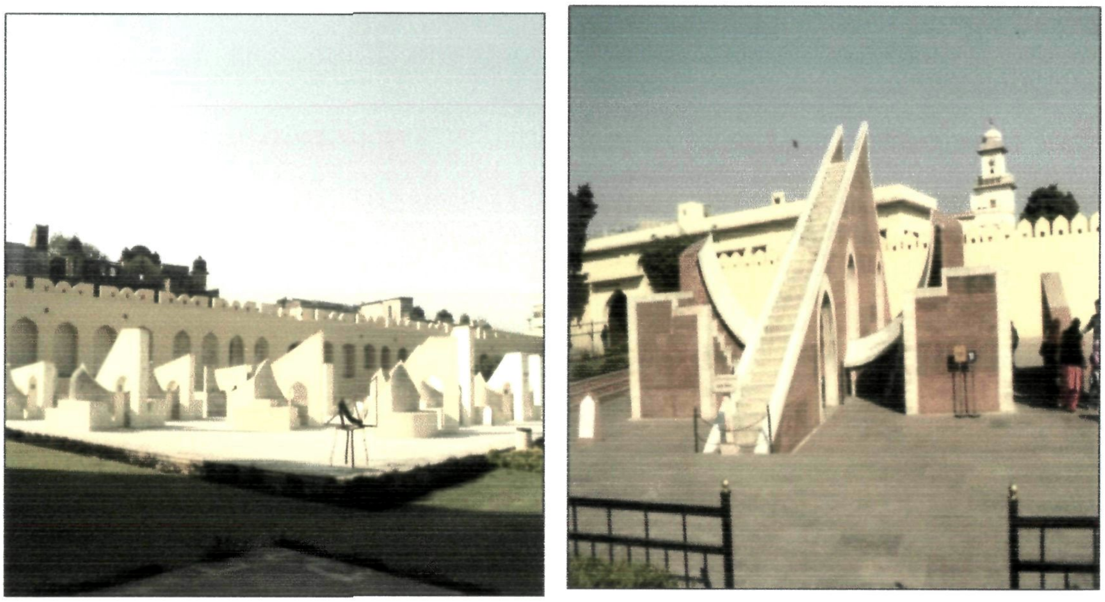
(B) Samrat-Yantra, Jaipur Observatory, Palace Complex, Jaipur

PLATE- 12



(A) (B)

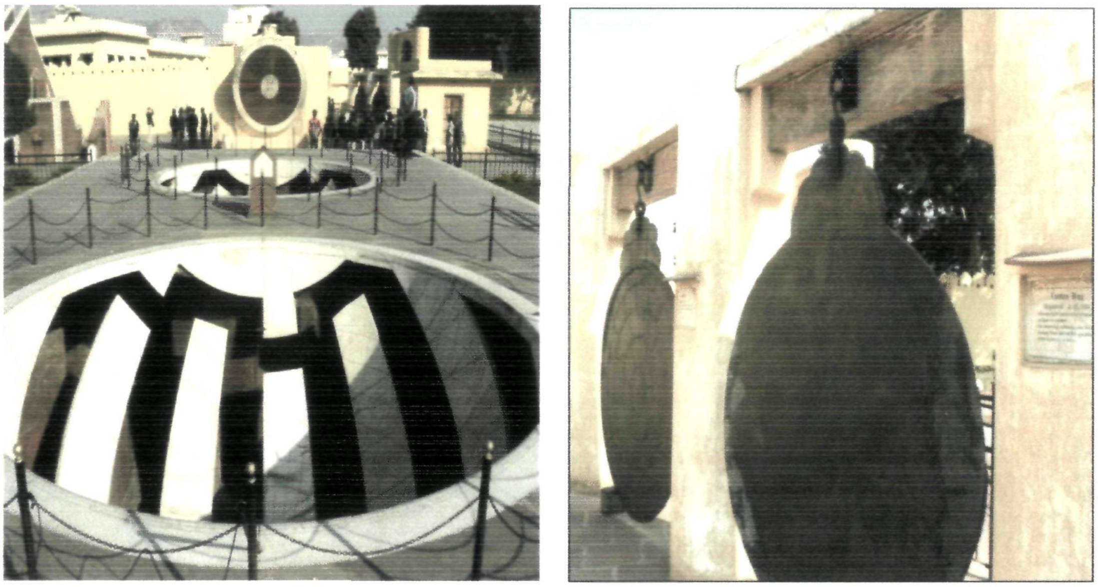
(A) Western & (B) Eastern quadrants of the Samrat-Yantra, Jaipur



(C) (D)

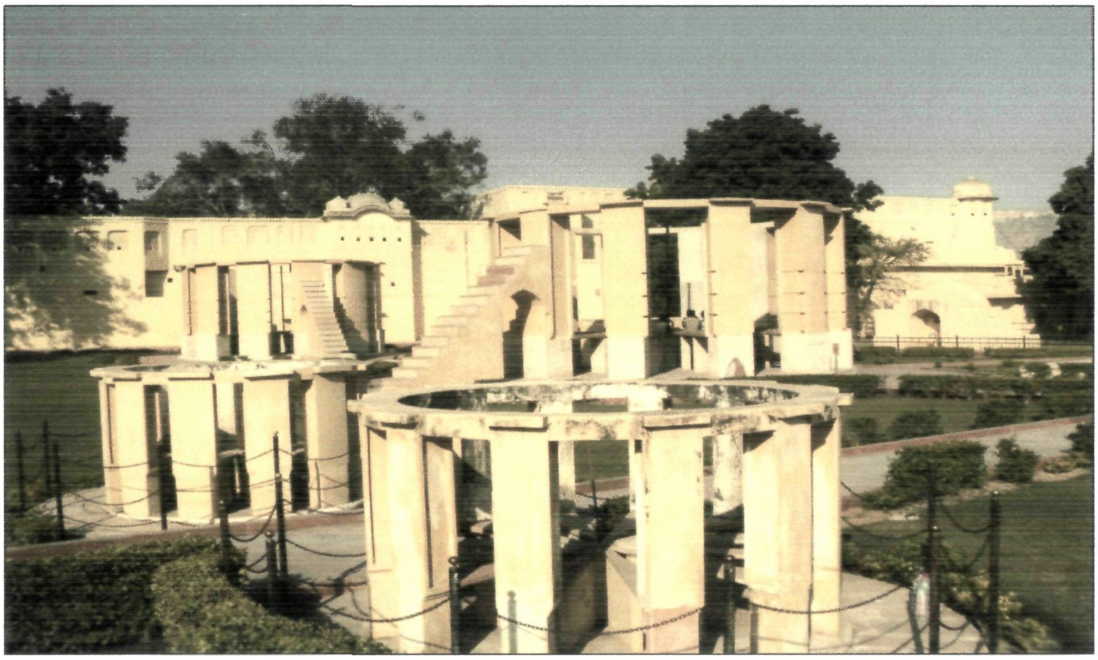
(C) The twelve Rasivalaya and (D) small Samrat-Yantra, Jaipur

PLATE- 13



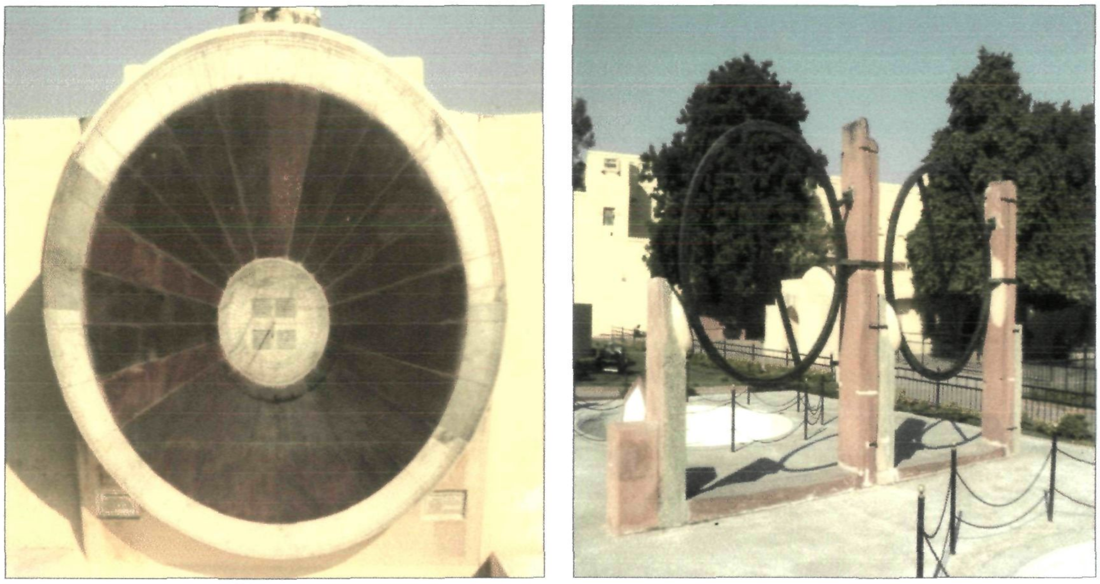
(A) (B)

(A) Jaiprakash-Yantra & (B) Yantraraj and its sister unit



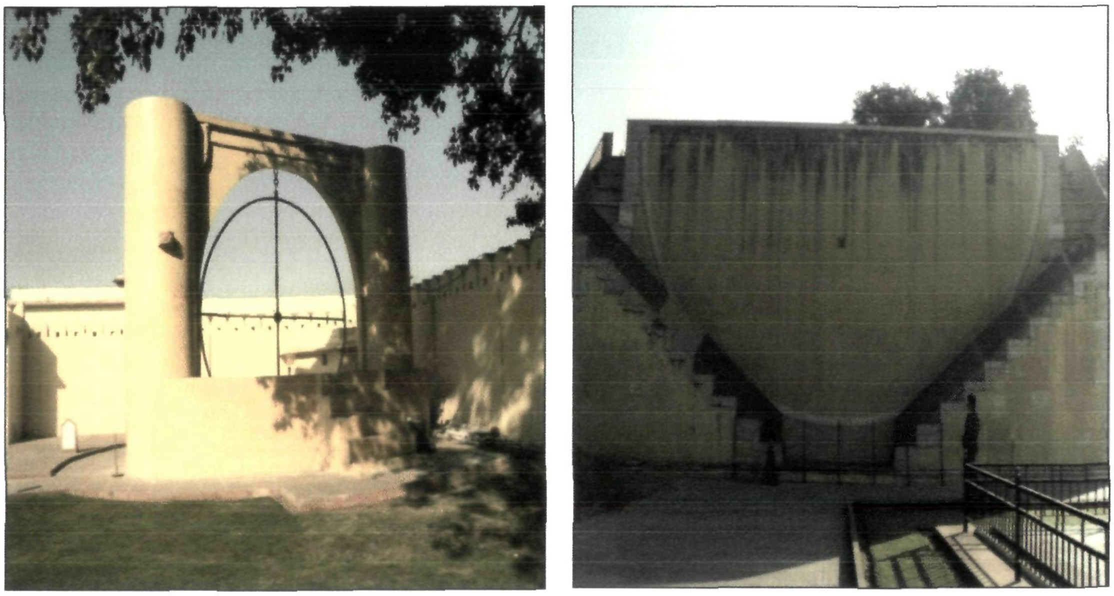
(C) Ramprakash and Digamsha Yantras, Jaipur Observatory

PLATE- 14



(A) (B)

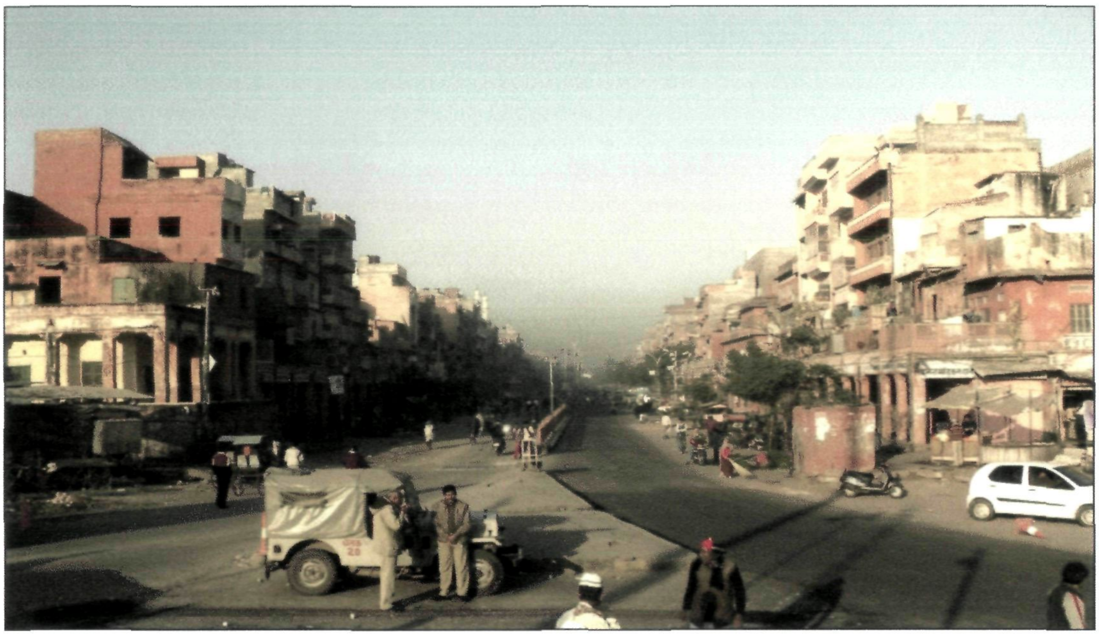
(A) Narivalaya-Yantra and (B) Chakra-Yantra, Jaipur Observatory



(C) (D)

(C) Unnatamsa-Yantra & (D) Dakshinovritti-Yantra, Jaipur Observatory

PLATE- 15



(A) Ramganj Market, the main axis-road (east-west), Jaipur

(B) (C)

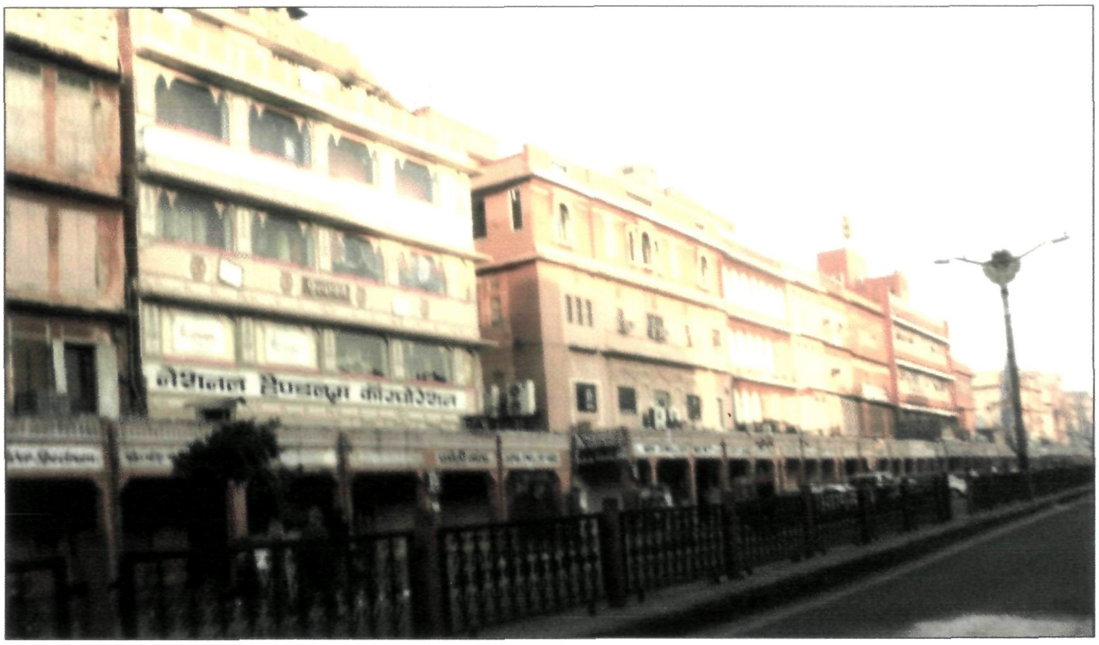
(B) Ramganj Chaupar and (C) Manak Chowk or the Bari Chaupar, Jaipur

PLATE- 16

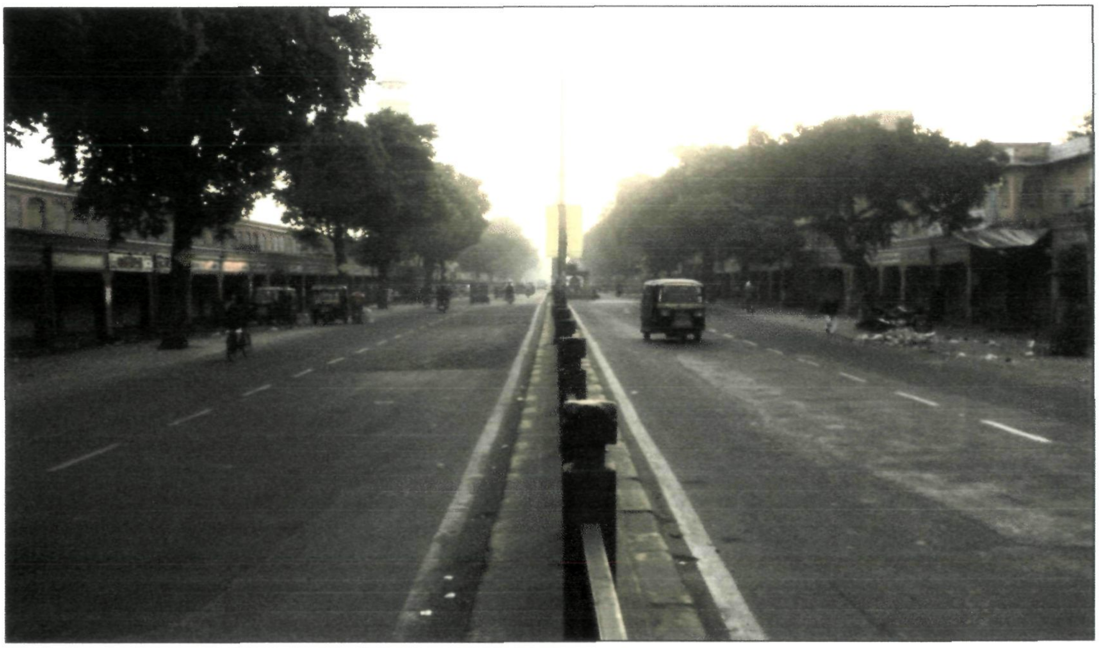
(A) A general view of the Johri Market from the Manak Chowk, Jaipur

(B) Shops, houses and a mosque in the western side of the Johri Market

PLATE- 17

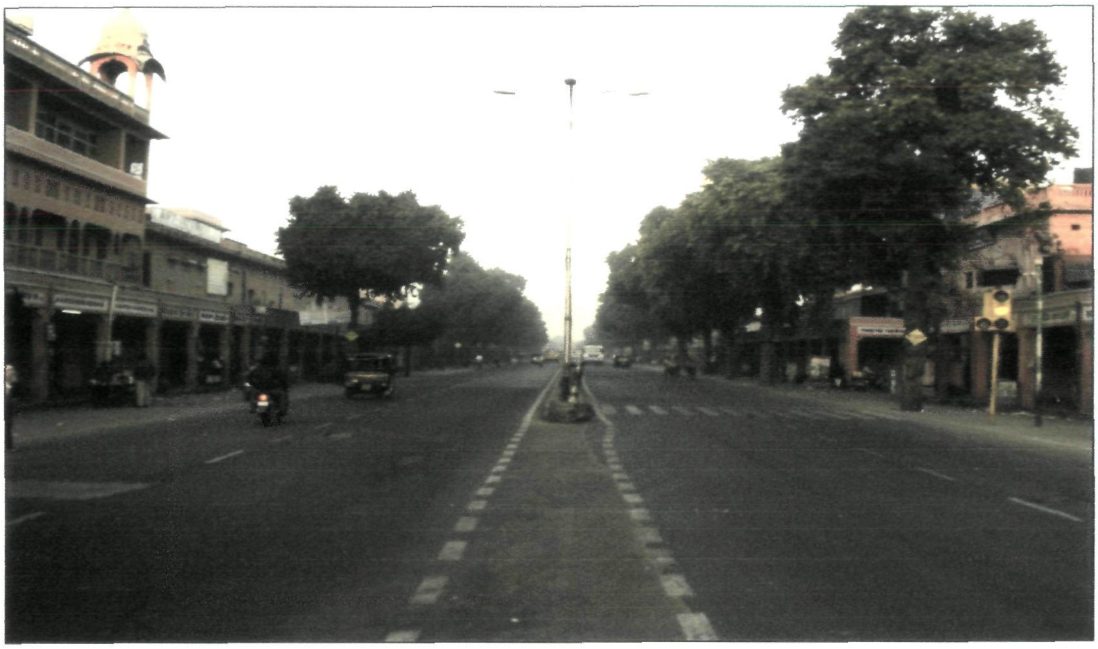


(A) Sky-line of buildings in the eastern side of the Johri Market

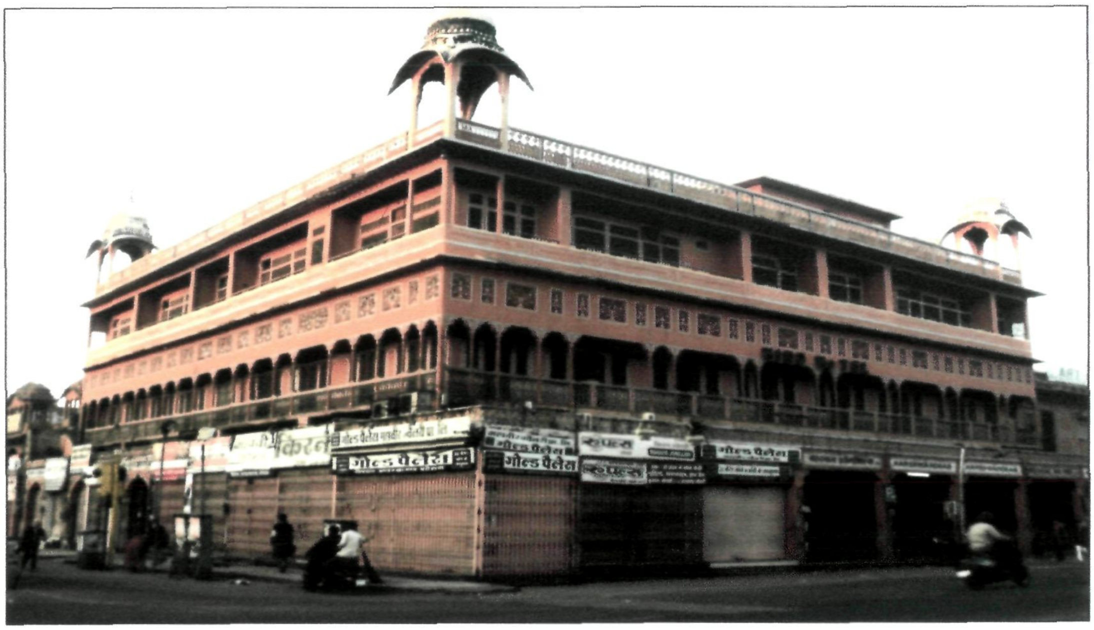


(B) Tripolia Market, the main axis-road (west-east), Jaipur

PLATE- 18



(A) Shops & houses in the 'Chora-Raasta' in front of Tripolia Gate



(B) A 'Haveli'/Mansion in the north-eastern corner of the Chora Raasta

PLATE- 19

(A) A closer view of shops in the northern side of theTripolia Market

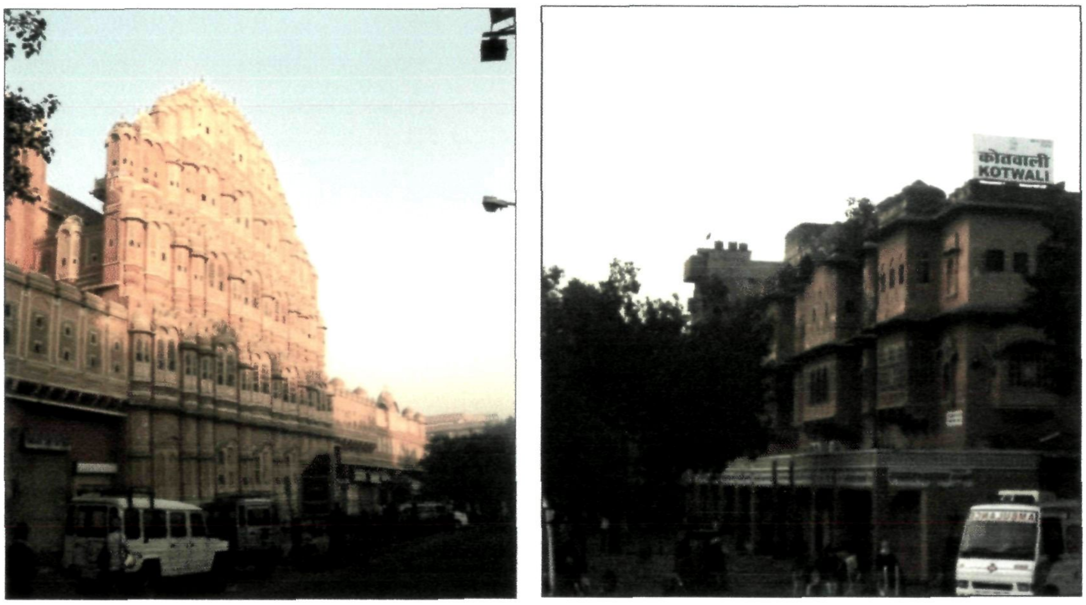
(B)

(C)

(B) Buildings in the Tripolia Market and (C) Amber-Chowk Jaipur

PLATE- 20

(A) Sireh-Deorhi or the Hawa-Mahal Market, Jaipur



(B) (C)

(B) Eastern side of the Palace Complex & (C) Kishanpol Market, Jaipur

PLATE- 21

(A) A general view of the shops and houses in the Gangori Market

(B) A view of Tripolia Market, from the Amber-Chowk, Jaipur

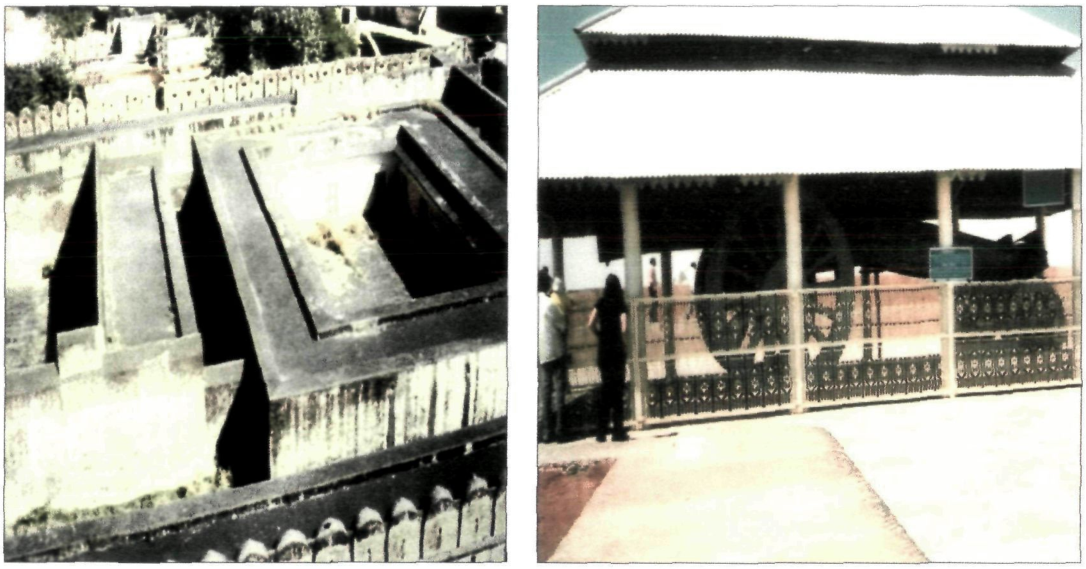
PLATE- 22

(A) Chandpol Market, the main axis-road (west-east), Jaipur

(B)
(C)

(B) Southern and (C) Northern sides of the Chandpol Market, Jaipur

PLATE- 23


(A) (B)

(A) Gun Foundry and (B) Jaivan Gun, Jaigarh Fort, Jaipur

(C) A view of the Nahargarh Fort, from Badal-Mahal, Jaipur

CHAPTER FOUR

FACILITATING THE JAIPUR CITY AS A CENTRE OF SCIENTIFIC LEARNING

Sawai Raja Jai Singh had attempted to found Jaipur as a Centre of scientific learning with more emphasis on Astronomy and Mathematics. To fulfill his aims, he collected a galaxy of scientists, reputed scholars, poets and other learned persons having specialties in different fields. He invited them from many European countries such as, Portugal, France, Bavaria, etc., and from different parts of India[1] especially from Banara, Karnataka, Gurarat and Maharashta. Besides providing various facilities, he built, in the north of the City, a separate colony, known as 'Brahmapuri', for scientists and scholars[2].

I

Sawai Jai Singh inherited from his forefathers, Raja Man Singh, Mirza Raja Jai Singh and Ram Singh the literary legacy[3]. Man Singh has established a Library, popularly known as *Pothikhana,* which was meant for keeping rare manuscripts. The manuscripts, paintings and art objects, collected by the predecessors of Jai Singh, were kept in safe custody at Amber[4]. Under Sawai Jai Singh, *Pothikhana* Library got special attention and was reorganized as a separate *Karkhana* or the state's manufacturing department[5] entrusted with all kinds of Literary Activities.

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[1] (i) A letter from the Mughal Emperor Muhammad Shah, quoted in the 'Preface' or Introduction to *Zij-i-Jadid Muhammad Shahi,* substantiates this fact. Muhammad Shah wrote to Jai Singh:

> "...you [Sawai Jai Singh] have already assembled the astronomers and geometricians of the faith of Islam and the Brahmans and Pandits and the astronomers of Europe."

(ii) Maclagan, Sir Edward, *The Jesuits and the Great Mogul, London,* ['The Mission to Jaipur'], 1932, pp.133-137;
(iii) Moraies, George, M., "Astronomical Mission to the Court of Jaipur 1730-1743", *Journal of the Bomhay Branch of the Royal Asiatic Society* (New Series), ed. by P.V. Kane, G.M. Moraes, etc., Vol.27, Part-I, London , Dec. 1951, pp.61-85;
(iv) Tod, Kernel, *Annals and Antiquities* of Rajasthan, Vol.II, London, 1832, p.289.

[2] This colony is still known by this name and where the remains of *havelis* or mansions of some of his scholars, such as, Paundarikji, Samrat Jagannath, etc., are existed in the Jaipur City.

[3] Gupta, J. K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", *Journal of Rajasthan Institute of Historical Research,* Vol. 15, Jodhpur, 1958, p.34

[4] Mirza Raja Jai Singh, the patron of the poet, Biharilal, seems to have paid special attention to the upkeep of the *Pothokhana.* Many manuscripts and paintings in the *Pothikhana* bear his seal. Ram Singh, the son and successor of the Mirza Raja had been educated at the college established by his father at *Kashi* (present district Varanasi) and he took a lively interest in the upkeep of the manuscripts acquired by his great father as well as himself. The *Khas Mohar* collection of the *'Pothikhana'* was mostly acquired by Maharaja Ram Singh. The father of Sawai Jai Singh, Vishnu Singh, maintained the tradition and added more works to the *Pothikhana,* Shikha Jain (ed.), '*Princely Terrain,* Gurgaon, 2005, p.141.

Pothikhana, which literary means 'library', was re-structured as a *Karkhana* i.e, workshop by Jai Singh[6]. A large numbers of writers, poets, calligraphers and painters continued to work in the *Pothikhana* until the State was merged into Modern Rajasthan. Sawai Jai Singh, in comparison to his predecessors, contributed most of the enrichment of the *Pothikhana*. Besides composition of many new works and translation of a large number of books under his patronage, Jai Singh himself supervised and wrote some books on astronomy, mathematics, religion and literature, and thus, left a deep impact on the literary history of Rajasthan[7]. Consequently, a large number of literary works on astronomy[8] and other subjects were produced in different languages[9] under Sawai Jai Singh. The voluminous scientific and religious literature of Sawai Jai Singh's period, preserved at Jaipur, testifies the great literary activities under him. A brief survey of these literary works is as follows:

Zij-i-Muhammad Shahi, a work in Persian (*Nashtaliq*), is a set of astronomical tables prepared after taking the astronomical observations at different places for a long period of seven years under the direction of Sawai Jai Singh. It was named after the ruling Mughal Emperor, Muhammad Shah. Though, the exact date of its completion is not clear, it appears from its contain that it was prepared around1728 A.D. and its later edition with elaborate 'Preface' or the introduction, having historical significance, was authored by Sawai Jai Singh himself. In its Preface, Jai Singh entitles it as "Zij-i-Jadid-Muhammad Shahi"[10] i.e. the new astronomical tables of Muhammad Shah, and he speaks himself in third person. The *Zij-i-Muhammad Shahi* consists of three sections (or books):

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[5] Though *Pothikhana* Library for manuscripts was established by Man Singh-I, Sawai Jai Singh gave it a prominent place among his famous '*Chhattis-Karkhana'*. This Library is still there in the City Palace, within the Palace Complex of the Jaipur City.

[6] In a library, painters and artists prepared portrait and miniature paintings and writers, poets and calligraphers performed their works while in a *Karkhana*, craftsmen or toy-makers gave shape to various human and animal forms in earth, pulp, paper and cloth. A library once established, may remain a show piece or place of reference, but the *Pothikhana* was recognized as a *Karkhana* or the manufacturing department with the object of it being continuously kept up to date through the composition of new works and the copying of old works.

[7] Gupta, J. K., "Maharana Kumbha and Sawai Jai Singh- As Patron of Letters", *Op.cit*, p.31.

[8] Sawai Jai Singh had inherited only a few books on astronomical subjects when he succeeded to the throne of Amber. As a matter of fact, as late as 1715, there were only 32 books on *Jyotisa*, or astronomy-astrology, in the royal library. However, Jai Singh left behind an excellent collection at his death. An inventory of his *Pothikhana*, or the library, which began in 1741 and was completed after his death in 1743, lists 188 books on different aspects of *Jyotisa*. Jai Singh built his excellent library by collecting books from far and wide. He received his Sanskrit books via Brahmins. For example, in 1714, he received from Nilamber Bhata a book on *Jyotisa* in 145 folios. He procured an incomplete Sanskrit version of Ulugh Beg's famous '*Zij-Ulug Beghi'* via Nandarama- V.N. Sharma, *Sawai Jai Singh and his Astronomy*, p 277), who brought it from Surat in 1725, *Dol* (*Siyah-Huzuri*, Jaipur), *Bhadra Pad Vadi* 2, V.S.1787/1730A.D., Jaipur Records, R.S.A., Bikaner.

[9] These works were in Persian, Sanskrit, Rajasthani and Hindi, and has been preserved in the ancestral collection of the Jaipur rulers in *Pothikhana*, at Jaipur and elsewhere.

(i) on the current eras i.e. the *Hijrah,* the *Muhammad-Shahi Era*, the *Christian Era* and the *Samvat Era*,
(ii) on the determination of the ascendants, and
(iii) on the motion of the planets, stars and their positions.

The first two sections follow Ulugh Beg and the third section, which is related with Jai Singh's own compilation work i.e. from the point where Ulugh Beg left, brings Ulugh Beg's tables up to date. The total number of stars given is 1018 following the Ulugh Beg's number and these are arranged identically in the same order as those of Ulugh Beg. Though the latitudes are the same as Ulugh Beg's, the longitudes differ by 4 degree and 8 minutes[11].

The '*Zij-i-Jadid-Muhammad Shahi'* has a great historical significance which lies in the fact that besides providing a detailed astronomical observations in terms of mathematical tables and equations depicting the motions and astronomical phenomena of the Moon, planets, Sun, Stars, constellations numbers and their names, Latitudes, Longitudes, Directions, and Magnitudes according to Ptolemy, Sufi[12] and Ulugh Beg, it throws light on Sawai Jai Singh's life, motives, approach & methodology behind his scientific pursuits. So far as, the date of completion of the *Zij-i-Jadid-Muhammad Shahi* is concerned, though it is not mentioned directly, it could be drawn from its Preface. According to the author of the Preface to the *Zij*, La Hire's *Tabulae Astronomicae*, which was published in Europe in the year A.D.1702[13], was brought to India by the 'fact finding mission' of Jai Singh after thirty years of its publication i.e. in the year A.D.1732, as he mentions,

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[10] Two hand-written coloured copies of both *Zij-i-Muhammad Shahi* and *Zij-i-Jadid-Muhammad Shahi* in the *Nashtaliq* Persian are available in the Manuscripts (MS) Section of Maulana Azad Library, AMU, Aligarh, bearing Nos. 'Suleman-527/6' and 'University Phalsafia-30' respectively, copies are also available at *Pothikhana,* Jaipur, 'British Museum' London, 'Raza Library' Rampur, and 'Khuda Baksh Library' Patna; Kaye claims, "Of this work [Zij-i-Muhammad Shahi], I found (A) an incomplete *Devanagari* Manuscript at Jaipur, and (B) a complete Persian Manuscript [*Zij-i-Jadid-Muhammad Shahi*] at the British museum. At first, B was supposed to be an original work, while A was said to be not the *Zij Muhammad Shahi* itself but Ulugh's celebrated catalogue brought up to date by Jai Singh and his assistants." Two pages of the *Devanagari* manuscript are shown in his book in Plate I (Fig. 1, 2), Kaye, G.R., '*The Astronomical Observatories of Jai Singh*', Calcutta, 1918, Archaeological Survey of India, New Imperial Series, Vol. XL, later published by Indological Book House, Varanasi, 1973, pp.8-9; Garret writes about the *Zij-i-Muhammad Shahi* : "I have been unable to procure the Sanskrit original or even a vernacular copy" and "up to the present time the only copy of Jai Singh's astronomical tables, or *Zeech Muhammad Shahi,* which has been obtained is a book in Persian characters ... Unfortunately, most of the figures are written in a kind of cipher, and although the key to this has been found, the thorough examination of this work will necessarily prove a long and laborious task", A. F. Garrett and Chandradhar Guleri, *The Jaipur Observatory and its Builder*, Allahabad, 1902.

[11] Kaye, G.R., *The Astronomical Observatories of Jai Singh-II*, Calcutta, 1918, p.10.

> "....having sent to that country several skilful persons along with Padre Manuel [de Figueredo] and having procured the new tables which had been constructed there thirty years before under the name of Lir [Philippa de La Hire] ..."

Thus, it is clear from the Preface of the '*Zij-i-Jadid Muhammad Shahi*' itself that it was written around 1732 A.D., and not in the year 1734, as Kaye concludes[14].

Under Sawai Jai Singh's patronage, Samrat-Jagannath[15], his teacher and one of the eminent astronomers, composed three works of great importance, as they enrich the knowledge of astronomy. *Samrat-Sidhanta* is a translation of *Al- Majisti*[16] from Arabic to Sanskrit, prepared under the direction of Jai Singh. *Rekha-Ganita* is a complete translation in Sanskrit of Euclid's Geometry, written in Arabic by Naifud-din[17] and *Sidhanta-Sar Kostubha* was his other Sanskrit translation.

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[12] Abdul Rehman b. Omar Abdul Husain al Sufi (d. A.D.986) who wrote on the fixed stars, astrolabes, etc., *ibid*, f.n.2

[13] Cf. Kaye, *The Astronomical Observatories of Jai Singh-II*, f.n.4, p.14.

[14] Kaye suggests, "There are some points about the preface that are not quite consistent with each other and known facts. The tradition is that the *Zij Muhammad Shahi* was competed in A.D. 1728 and this is, to some extent, confirmed by the Jaipur MS [Manuscript].; the preface was written some time after all the observatories had been built, that is after 1734, and "more than 300 years" after (the death of) Ulugh Beg. ...The legitimate conclusion is that the preface was written some considerable time after the tables had been completed, cf. Kaye, *The Astronomical Observatories of Jai Singh II*, f.n.2, p.15.

[15] B.N. Tomani, No. 14-25, Rajasthan State Archives, Bikaner.

[16] It is an Arabic version of Ptolemy's work.

[17] He wrote these works in 1735 A.D., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters",*Journal of Rajasthan Institute of Historical Research,* Jodhpur, 1978, Vol.II, pp.35-36.

Keval Ram, another prominent astronomer of Jai Singh, wrote *Bibhaga Sarani* which was a Sanskrit translation of logarithmic tables, *Drig-Paksha Sarani* and *Drig-Paksha* were based on Philippa de La Hire's tables, *Nithya-Jiwachchhaya Sarani* was based on a French work on Logarithm (Napier's *Logarithms*), and *Tara Sarani* was based on Ulugh Beg's book on the movement of stars. *Jai-Vinod Sarani* a work in Sanskrit is very useful for preparing *Panchanga* and calculation of *Grahs* (planets) and *Nakshatras* (stats) and *Jai-Singh Kalpa-Lata* is a fragment pertaining to the calculations of the movements of stars[18]. His literary works which have survived are *Abhilash-Shatkam* and *Ganga-Stuti*[19]. Another astronomer, Nainsukhopadhyay wrote *Ukar Rekha-Ganita*[20] or *Ukar-Grantha* containing three chapters which is a Sanskrit translation of *Ukar*, a work on Geometry in Arabic[21], and he also translated *Zij-Ulughbeghi* and *Sharha-Tazkarah-Berjandis* from Persian into Sanskrit. Other works of Sanskrit translation were *Somsidhant*, *Hayat-Grantha*[22] and *Jataka-Sangrah* or *Jatakaraj-Paddhatih*by Yasah Sagar, and *Zij- Nithyanandi Shahjahani* by Nithyananda[23].

Sawai Jai Singh, besides providing direct supervision in the completion of many works, has also authored two books[24], *Jai-Singh Karika*, and *Yantraraj-Rachna Prakash*[25]. These books contain detailed description of the construction of the *Yantraraj*, an instrument fixed in the observatories. *Yantraraj-Rachna Prakash* consisting two chapters with an introduction by Kedarnath deals with the method of construction of Arabic astronomical instruments. It has been published by the Rajasthan Oriental Research Institute (RORI), Jodhpur[26]. Jai Singh himself composed *Nibadityabhashya-Virodhavyakhyanam*, *Krishna-Sandarva Sangati*, *Shatsandarbh-Suchanika, Sri Ram-Krishnekya*, *Rampurna Vatara-Tatva Nirupanam*, *Ramsandarbh, Rama Tatva-Prakash, Bhagavatamrit-Sangatam, Sanchhipt-Sankhya Sutra Vrit*[27]. Having critically studied the main works of *Bhakti Sutra* of Vyasadeva and commentaries by the exponents of different sects, Jai Singh concluded that no material controversy existed in them. He therefore, himself compiled a *Vriti* on these *Sutras* under the title *Brahma-Bodhini*[28], and tried to reconcile the different views held by the *Acharya*[29]. Jai Singh also wrote *Ramayan-Virosh Parihar* to show there was no controversy or contradiction in the different *Ramayanas*, e.g. *Valmiki-Ramayan* and *Bhasundi-Ramayan*, etc.[30]

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[18] Gupta, J. K, "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", *Op.cit.* p.36
[19] V.S. Bhatnagar, *Life and Times of Sawai Jai Singh*, De;hi, 1974, p.345.
[20] Cf. Gahlot (Jaipur), *Op.cit.*; G.N. Sharma, *Rajashtan*, p.52; Ojha, *Nibandha Sangrah*, p.110.
[21] Gupta, J.K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", *Op.cit*, p.36
[22] It was a translation from Persian.
[23] Gupta, J.K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", p.145
[24] Cf. Ojha, *Nibandha Sangrah,* p.110.
[25] Gupta, J.K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", *Op.cit.*
[26] Ibid, p.37
[27] Manuscripts are available in *Pothikhana*, City Palace, Jaipur.

Shri Krishna Bhatt, a well known poet and scholar who belonged to South India (Karnataka), was brought to Jaipur from Bundi for *Ashvamedh* or horse sacrifice[31]. Shri Krishna was popularly known as *Kavi Kala-Nidhi*[32]. He composed a number of works on a variety of subjects. Out of his all works, three Sanskrit works- *Padyamuktavali*[33], *Vrattamuktavali*[34] and *Ishvaravilasa Mahakavyam*[35]- have been published so far. *Vrattamuktavali* is a unique work on metrics. It illustrates meters from the Vedic times to those in the poet's own time, all the verses illustrating the meters being the poet's own composition. Sri Krishna wrote three books on *Rama*-Legend; *Ramchandrodaya, Balkanda* and *Lankakanda. Ramarasa* was completed in V.S.1788/1731A.D. *Raghavagitam* or *Ramgitam* is composed after the style of Jaideva's *Gitagovinda*[36]. The work is regarded as his best creation, excelling both in use of meters and metaphors and won for the author the title of *Ramarasacharya* from his patron. His *Prasastimurtavali* is a work on the art of letter writing and essays, and *Sundaristavarat*, based on *Shaundaryalahiri*'of Shankaracharya is an important contribution to Sanskrit *Strota* literature[37].

Baldev Vidya Bhushan, student of Visvana Chakravarti, the famous commentator on *Bhagvat Puran*, wrote a famous *Bhashya* or commentary. It is said that he did this at the instance of Sawai Jai Singh. He resided in the temple of *Govind Devaji* at Jaipur so long as he wrote the commentary which is named also as *Govin Bhashya*[38]. Brignath Bhatt Dixit, son of Prabhakar Bhatt and nephew of Ratnakar Bhatt Paundarik and was brought to Jaipur from Mathura by Sawai Jai Singh at the time of *Ashvamedh* where he worked as main *Purohit* of the *Yajna* ceremony[39], was an erudite *Pandit*, well-versed in *Shashtras*. He was a follower of Shri Bhattabhacharya, but he became a trusted advisor and constant companion of Jai Singh[40]. Krishna Dev Bhattacharya of the *Gaudiya Sampradai*, a scholar from Bengal, received patronage from Jai Singh. He wrote three treaties on the well known paths of Action, Devotion and Knowledge, (i) *Karam Vivriti*-Jai Singh himself made necessary modifications in the book; (ii) *Bhakativivrity* and (iii) *Gyana Vivaranam*[41].

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[28] Bahura G.N., *Literary Heritage of the Rulers of Amber and Jaipurt*, Jaipur, 1979, p.6.

[29] Gupta, J.K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", *Op.cit*, p.25

[30] Ibid, pp.25-26

[31] Ibid., f.n.1, p.37.

[32] Shastri, *Op.cit*, pp.149-213

[33] Published by Rajasthan Oriental Research Institute (R.O.R.I.), Jodhpur, 1959

[34] Published in 1963, *Ibid.*

[35] Published in 1958, *Ibid*; Though, it was written later in 1749A.D., it is a good work thematically as well as from literary point of view, it describes the Jaipur City during Sawai Jai Singh and his son Ishvari Singh's period, and the detailed description of the *Ashvamedha* performed by Sawai Jai Singh, V.S. Bhatnagar, *Life and Times of Sawai Jai Singh,* 1974, *pp.344*-345.

[36] Gupta, J.K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", *Op.cit*, p.37; Cf., V.S. Bhatnagar, *ibid.*

[37] Cf. V. S. Bhatnagar, Life and Times of Sawai Jai Singh, pp. 345-346.

Sawai Jai Singh's minister Vidyadhar also made Hindi translation of *Upanishad-Sar*. *Sindhanta-Akhya-Prakashika* was got compiled, scrutinized and improved by Jai Singh who called himself a devotee of Krishna. The Maharaja carefully and critically studied *Shandhilya-Sutras* in the company of the learned scholars and got a new commentary (*Bhashya*) prepared in V.S.1783/1726 A.D., while he was in Delhi. This commentary was entitled *Shandilya-Sutra Vyakhya*[42]. Pandit Hari Krishna Mishra, a Karnataka Brahman, who was invited to Jaipur on the eve of the *Ashvamedha* by Jai Singh,[43] composed *Vaishnava-Sadachar Vidhi*or Vedic *Vaishnavasadachar*[44] which deals with the duties of *Vaishnavas* and the rules of conduct prescribed in the *Dharma Shastras*[45].

Shat-Sandarbha-Sangati and *Sidhantaikya-Prakashika* are compilations by contemporary *Pandits* under the active supervision of Sawai Jai Singh. To co-ordinate the work of different school of *Vaishnavism* and also to establish their identity with Vedic religion, Jai Singh directed *Dhama Shatra* advisor Hari Krishna Mishra to compose a new work named *Prabharvaidika-Puja* dealing with the Vedic sects. He composed Vedic

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[38] Bahura, G.N., *Literary Heritage of the Rulers of Amer and Jaipur, Op.cit,* p.67; *Journal of Rajasthan Institute of Historical Research*, Vol.18, Sep-Dec.1980, No.3, S.No.4, p.24

[39] Gupta, J.K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", *Op.cit.*

[40] Selection from *Peshwa-Daftar*, Vol. XXV, p.108

[41] Gupta, J.K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters, *Op,cit.*

[42] Ibid.

[43] Cf. V.S. Bhatnagar, *Life and Times of Sawai Jai Singh*, p.345

[44] Ibid.

[45] MS No.148, *Hari Narain Collection*, Rajasthan Oriental Research Institute, Jaipur Branch

Vaishnav Sadachar also at the time of *Ashvamedh*. *Shankar Bhashya Sanyajnam*[46] was got compiled in V.S.1796/1739 A.D, to show that the *Vaishnavite* principles and different sects were not opposed to the *Vedantic* commentary on Sutras by Shankarachaya[47]. Bal Krishan alias Lalu Bhatt, son of Trivikram Bhatt, a follower of *Purshtimargya Sampradaya* of Vallabhacharya, composed *Premratnarnavah, Bhed-Bhedo-Nirupanam, Kamamarga-Premamarga-Vivriti, Sarvatma- Bhava-Prakarnam*; and dedicated to Sawai Jai Singh[48].

Sawai Jai Singh developed his interest in the four principal Vaishnava Schools of devotion viz: *Nimbark, Madhava, Vallabha* and *Ramanujiya*, all devoted to the incarnation of Vishnu[49]. Schools belonging to *Ramanuja* School of *Vaishnavism* also received patronage from Jai Singh. Vankatacharya, the followers of Ramanuja, composed *Bheda-Sthapanam.* Similarly, Svapneshvara-Charya composed *Shandilya-Sutra-Bhashyam* which is a commentary on Bhakti Sutra according to the Ramanuja School. Tularam composed '*Bhusundi Ramayan*', *Pushkarmamya, Bhagvadgita Bhashyam, Kosel Kand* of *Haripuram, Sita-Sahasra-Nama, Bhavanmamrjta-Kavya*, and *Ananga-Raghavam* for the Maharaja as desired by him[50]. Maya Ram Mishra Pathak Gaur wrote *Dharamshastras* viz: *Vyavhara-Nirnaya, Parva Nirnaya, Vyavahar Sara, Vyavhara-Smriti-Sarvasyam*[51].

One of the most revered scholars at Jai Singh's Court was Ratnakar Bhatt Paundarik, a Maharashtrian Brahman and the chief disciple of Nagesh Bhatt, the celebrated grammarian who resided at Banaras. Ratnakar was well versed in the various *srauta* ceremonies and *Sanskaras*. In 1713 A.D., he completed *Jai Singha Kalpadrum*[52], a monumental work on Hindu rituals[53] and a celebrated one for determining the tithes (dates) for the observance of different *vratas* (religious festivals)[54]. He performed *Vajpeya* and *Paundarika* sacrifices. After performing the latter *yajna*, he became well-known as "Paundarikji". His son, Sudhakar Paundarik was the author of *Sahityasarassangrah.* Later, when Jai Singh performed the *Purushmedha*, Sudhakar conducted the sacrifice[55]. Girdhari wrote *Bhojanasar* in 1739 AD. It gives a vivid description of the Jaipur City- its foundation, planning, business, etc. during Sawai Jai Singh's period. It is a very important and rare primary source which throws light on different aspects of the contemporary city of Jaipur. Its only survived copy is available at the Bhandarkar Library, Pune.

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[46] The manuscript is available in *Pothikhana.* City Palace, Jaipur.
[47] *Hari Narain Collection, Op.cit,* pp.24-25
[48] Cf. Gupta, J.K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", p.25
[49] Bahura, G.N., *Literary Heritage of the Rulers of Amer and Jaipur, Op.cit*, p.61.
[50] Ibid, pp.25-26.
[51] Bhatnagar, V.S., *Life and Times of Sawai Jai Singh, Op.cit.*
[52] Ibid, p.344
[53] Ojha, *Nibandha Sangrah, Op.cit*, p.111
[54] Bhatnagar,V.S., *Life and Times of Sawai Jai Singh, Op.cit.*

Besides these Sanskrit works, a few works in Rajasthani such as Dingal and Pingal, were also composed. Among these are a few commentaries, such as *Bhaktiamal Tika* and *Bhagavata Bhashya* by Priyadas Surat Mishra who was a court-poet of Bikaner and later of Jaipur, wrote *Amarchandrika*, a commentary on *Bihari Satsai.* He also wrote *Kavyasidhanta* and *Kavyasiddhantasartha.* Shrikrishna Bhatta Kavi Kalanidhi, who contributed to Sanscrit literature, as mentioned earlier, composed *Sambhar-Yuddha*, *Jayav-Yuddha*, *Alankarkalanidhi*', *Vrittachandrika*, *Bahadur-Vijaya* and *Ramarasa.* Some *Khyats* were also written in '*Dingal* but from literary point of view they are not substantial[56]. The well known poets at Sawai Jai Singh's Court were Khushal Chand, Kishan Singh and Todar Mal. Khushal Chand translated several poetical works in Hindi and wrote *Hari-Vansha Puran, Padya Puran, Uttar-Puran, Vrata-Katha Puran, Jamboo-Charitra* and *Dhanya-Kumar Charitra*[57], Todar Mal translated *Gomatasara* which contains 4500 verses in *Prakrit*[58].

Sawai Jai Singh also extended his patronage to the scholars for the production of literature pertaining to historical significance. Many works of historical importance were also procured for *Pothikhana.* Some of these are: *Ram Vilasa-Kavya, Sambhar-Judh, Ishwari-Vilasa-Mahakavyam, Kush-Vansha-Charitam,* a *vamshavali,* and *Sawai Jai Singh-Sujasa-Kavita-Sangrah*[59].

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[55] Ibid.

[56] Cf. V.S. Bhatnagar, *Life and Times of Sawai Jai Singh*, pp.345-346

[57] G.N. Sharma, *Administrative System of the Rajpurts, Op.cit,* p.281

[58] Gupta, J.K., "Maharana Kumbha and Sawai Jai Singh-As Patron of Letters", *Op,cit,* p.26

[59] *Journal of the Rajasthan Institute of Historical Researches*, Vol, IX, Oct-Nov. 1972, p.45

Jai Singh also procured some very important and rare printed works which are preserved in the *Pothikhana*[60]. He had obtained these books from Europe for the pursuits of his scientific studies. References of some of the books from this collection are as follows:

1. *Historia Coelestis Britannica* by Flamstead, the First Astronomer Royal of Britain, in three volumes [Nos.84-85] printed in 1725 A.D. The third volume contains four sections- (I) Prolegmene, (II) Stellorum and Fixarum, (III) Clandis Ptolemaei and Ulughbeghi, fixarum catalogik, and (IV) Tabulae Astronomicae.
2. *Observations Chinoise*, Vol.II by P. Garibi (1732) [No.47 J.M.]- (I) Mathematics (II) Astronomy (III) Geography (IV) Chronology and (V) Physics.
3. *Ad Astrum* (Astronomy) (1557) bears a seal No.48 J.M.
4. *Dictinarium Latinum* (16th C.), No.49 J.M.
5. *Description and Use of Sector and Other Instruments* (Geometry) (1636) bear a seal No52 J.M.
6. *The Pathway of Knowledge*, printed at Paul's Churchyard, London (1551) bears a seal No.52 J.M.
7. *Seamen's Calendar* (English) (16th C.), No.53 J.M.
8. *Common Accidence Examined* (English grammar) by Charles Hook printed at Mercus Chappel, London (1663), No, 55 J.M.
9. *Traite De Physiques* (1675), No.57 J.M.
10. *Sphera* (Latin) by Alcay Joseph-du-Buoy written in 1732 at Jaipur (Reserved Collection), No.36.

Thus, the survey and analysis of the above long range of literary and scientific works of Sawai Jai Singh's period, available at the *Pothikhana*, his Royal Library, the Maharaja Sawai Man Singh II Museum at Jaipur and the establishment of *Brahmapuri*

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[60] The manuscripts of *Razmanama* and *Shahi-Ramayan* (the Persian translations of the Epics Mahabharata and Ramayana by the Akbar's court historian and poets, Faizi and Abul Fazl) were became a part of the *Pothikhana* during the period of Sawai Jai Singh's son, Madho Singh-I.

Colony, confirm the scholarly and voluminous literary activities at Jaipur under the supervision of Jai Singh.

II

Under Jai Singh, a great quantum of literary and scientific works was produced which confirms his efforts to found the city of Jaipur as a centre of scientific learning. To trace his real intention behind his scientific ventures especially Astro-mathematical pursuits[61], it is very imperative to investigate his objectives along with his approach and methodology, behind his scientific ventures especially in the fields of Astronomy and Mathematics.

The real motive of Jai Singh behind his astronomical pursuits was to rectify the short comings in the existing traditional calendars for the fulfillment of administrative as well as religious requirements, as confirmed from the Preface of the *Zij-i-Jadid-Muhammad Shahi*[62], which was written by him. It reads:

> "... [Sawai Jai Singh] found that the calculation of the places of the stars as obtained from the table in common use, such as the new tables of *Said Gurgani* and *Khaqani*. And the *Tasahilat-Mulla Chand Akbar Shahi*, and the Hindu books, and the European tables, in very many cases give them widely different positions from those determined by observations, especially in the appearance of the new moons, the computation does not agree with observation. Seeing that very important affairs, both regarding religion and the administration of the Empire, depend upon these; and that in the time of rising and setting of the planets, and the seasons of eclipses of the Sun and Moon, many considerable disagreements of a similar nature were found- he [Sawai Jai Singh] represented the matter to the Emperor Muhammad Shah, who was pleased to reply:
> "Since you, who are learned in the mysteries of science, have a perfect knowledge of this matter, having assembled the astronomers and geometricians of the faith of Islam and the Brahmans and Pandits, and the astronomers of Europe, and having prepared all the apparatus of an observatory, do you so labour for the ascertaining of the point in question, that the disagreement between

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[61] According the author of a contemporary Persian text, *Shafina-i-Khushgo*, Jai Singh spent two million rupees in the course of 20 years on his astronomical pursuits and that he expended these sums on the advice of a Muslim astronomer, Khairullah in the Court of Jai Singh, *Shafina-i-Khushgo* of Brindavan, Patna, 1959, Khudabakhs Library, Bankipur, Patna, f.123.

[62] Though, the original Persian Text is available at Aligarh and Jaipur has been studied personally and thoroughly, its translation is based on W. Hunter's, "Some Account of the Astronomical Labours of Jayasinha, Rajah of Ambhere or Jayanagar", *Journal of Asiatic Researches*, Vol. V, Calcutta, 1799, ff.177-212 (Eng. Tr. of the Preface to *Zij-i-Jadid-Muhammad Shahi*, ff. 178-189).; Kaye re-produced the same translation in full, Kaye, *The Astronomical Observatories of Jai Singh II, Op.cit*, pp.10-15.

> the calculated times of those phenomena and the times which they are observed to happen, may be rectified.
>
> "Although this was a mighty task which during a long period of time none of the powerful Rajas had prosecuted; nor among the tribes of Islam, since the time of Mirza Ulugh Beg, to the present period, had any of the small did kings turn his attention to this object. Yet to accomplish the exalted command he had received, he constructed here [Delhi] several of the instruments of an observatory, such as had been erected at Samarqand [by Ulugh Beg], agreeable to the Muslim books, such as *Zat-al-Halqa* of brass, in diameter three *gaz*[63] of the measure now in use and *Za-al-Shabatain* and *Zat-al-Zaqatain* and *Sadi Fakhri* and *Shamalah.*"[64]

The methodology[65], followed by Jai Singh in carrying out his scientific pursuits (improving astronomy), speaks of a systematic covering of every dimension required for the scientific investigation and development[66], which can be analyzed in the following stages:

(I) Collecting literature and studying the subject i.e., the "Institutionalization" of scientific knowledge,

(II) Improving instruments and taking observations i.e., "Instrumentation and Observations", and

(III) The developing of Mathematics by finding and defing patterns in the movements of celestial bodies from the observed data and mathematically predicting their future phenomena i.e., "Theorization".

It is clear from the Preface to *Zij-i-Jadid Muhammad Shahi*, Jai Singh had acquired, by constant study and labour, a thorough knowledge of the principles and rules of the mathematical science, pertaining to Astronomy. In his Preface to the *Zij-i-Jadid Muhammad Shahi*, Jai Singh mentions,

> "...Since the well-wisher of the works of creation and the admiring spectator of the theatre of infinite wisdom and providence he [Sawai Jai Singh], from the first downing of reason in his mind and during his progress towards maturity, was entirely devoted to study of mathematical science and the bent of his mind was

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[63] A unit of measurement, 3 *gaz* = 9 feet ordinarily, but perhaps here a *gaz* =1 *danda*=6 feet approximately, Cf. Kaye, *The Astronomical Observatory of Jai Singh-II*, f.n.9.p.12.

[64] Hunter, W., "Some Accounts of Astronomical Labours of Jaya Sinha Raja of Ambhere or Jayanagar", *Op.cit*, ff.178-179. The *Jai Prakash-Yantra* is called *'Shamalah'* by Hunter, Kaye, *Op.cit*, f.n.12, p.12.

[65] Here it is quite relevant to examine as to what were the intellectual influences on Sawai Jai Singh's astronomical activity and in what manner they moulded his approach and methodology.

[66] It gives an idea of a precise mind, a mind which was both clear and confident of what was being done.

> constantly to the solution of its most difficult problems, by the aid of the Supreme Artificer he obtained a thorough knowledge of its principles and rules..."[67]

Jai Singh, first studied works of ancient Indian astronomers' like- Aryabhatt, Brahmgupta, Bhakaracharya, etc., works written by the Central and West Asian astronomers such as Nasir-al Din-al Tusi, Mirza Ulugh Beg, etc.[68], along with the works of ancient Greek astronomers such as Ptolemy. Besides, Jai Singh was well aware of contemporary developments in Europe in the field of Mathematics. He had acquired various Greek and Arabic works as well as other European texts dealing with subject such as Plane and Spherical Trigonometry and the use of Logarithms[69] translated into Sanskrit.

Among the early astronomers and mathematicians works of Central and West Asian astronomers, such as, Abdul Rehman b. Omar Abul-Hussain al-Sufi (d.986 A.D.), Nasir-al Din-al-Tusi (b.1201 A.D.), Ali b. Muhammad al-Sayyed al-Sharif (1339-1414 A.D.), Jamshed b. Abul-Jijat al-Din al-Kashi (Circa 1440A.D.), Ulugh Beg (1344-1449 A.D.), and Maulana Chand (Circa 1550 A.D.) had been thoroughly studied and referred by Jai Singh. Nasir al-Din al-Tusi was in the service of Hulaqu Khan who had led him built an observatory at Merrgah, in north-western part of Persia, in 1259 A.D. The observatory was equipped with instruments remarkable for their precision and dimension; it was surpassed only by Tycho Brahe (1546-1601A.D.)"[70]. Tusi wrote a manual of astronomy, and started work on astronomical tables for calculating the movement of planets and giving a catalogue of stars based on new observations. He published his observations in the famous *Ilkhani Table*[71]. Timur's grandson Mirza Ulugh Beg, assisted by Jamshed al-Kashi, built an observatory in 1420 A.D., and published new tables of planets and a catalogue of stars, which Jai Singh brought up to date, comprising those given by Ptolemy, besides new ones observed by him, and for the first time stellar co-ordinates, celestial latitude and longitude were given degrees as well as minutes. Jai Singh was deeply influenced by the astronomical works of the Muslims, especially of Ulugh Beg, to such an extent that his masonry instruments have been designed after the notion taught by the Muslim astronomers and had surprisingly nothing in common with those described in Indian works[72].

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[67] Hunter., "Some Accounts of Astronomical Labours of Jaya Sinha." , *Op.cit*, f.179.

[68] Regarding the Indian and Arabic schools, Kaye suggests, "The characteristic difference between these is connected with practical work. The Hindus [Indian] were practical astronomers, only in so far as they could calculate, from a given starting point with given rules, the positions of the planets, eclipses, etc., with some accuracy. This, of course, implies a very considerable amount of knowledge and skill; but the Hindus had no instruments of precision of their own before Jai Singh's time; neither were they interested in making practical observations of the heavenly bodies. Their rules and the elements given in their approved works sufficed them. The standpoint of the Arabs was entirely different: they were particularly interested in the verification and correction of previously recorded results [The interest in astronomy in the Islamic world was based on practical concerns, e.g., Muslims had to face Mecca during prayer and the mosques had to be built to accommodate this requirement. In addition, Islamic festivals or holidays were all geared to the lunar calendar. The prayers were offered five times a day and for this exact time-keeping was necessary so that the timings of the prayers could be kept with precision. All these required the accurate knowledge of the motions of the planets and realizing that these goals could only be fulfilled if there were better astronomical tables, rulers built observatories in different parts of the Islamic world.]. They built what were then the finest observatories in the world, and they perfected the astrolabe to an extraordinary degree; And, regarding the intellectual influences on Jai Singh and his approach, Kaye mentions, "He [Jai Singh] followed Mirza Ulugh Beg of Samarqand. Since both the Hindus and Arabs obtained their astronomy from the Greeks, they have much in common, but the work of Jai Singh was exactly of that nature which differentiates between the two schools; and, what the Muslim astronomers had, and, what Hindus lacked, attracted Jai Singh. In his work there is no point of contact with Hindu astronomy that did not also touch the work of the Muslim astronomy that are remote from the teaching of the Hindu schools, cf. Kaye, *The Astronomical Observatories of Jai Singh II*, p.89.

[69] Napeir's *Logarithms, op.cit.*

Jai Singh also collected and studied some of the European Astronomical works, such as Euclid's *Elements of Geometry,* Hipparchus, Ptolemy's *Almagest* and *Tabulae Astronomicae* of Philippa de La Hire (1640-1718 A.D.)[73]. Jai Singh's keenness to become acquainted with the latest advancement in the field is proved by his attempt to obtain a copy of the '*Historica Coelestis Britannica*'[74] by J. Flamstead, who was the first director or the Astronomer Royal of the Greenwich Observatory[75] founded by the King Charles II of England in 1675 A.D. It contains the catalogue of the coordinates of 3000 stars[76] and sextant observations, observations with sharp mural Arc, description of the instruments used by Tycho Brahe, Hevelius, his own, etc. the star catalogues or the tables of Ptolemy, Ulugh Beg, Tycho Brahe, the Landgrave. Other possible tables are the Toletan Table of 1080; the Alfonsine Tables, 1252; Reinhold's Prussian Tables, 1551; Kepler's Rudolphine Tables, 1627; Qassini's tables, 1668 and 1693; Halley's tables, 1719; etc.[77]

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[70] Abetti, *Op.cit.*, p.48.

[71] Cf. Kaye, *The Astronomical Observatories of Jai Singh II*, f .n. 2, p.11

[72] Ibid., pp.88-89. Kaye points out that the Arab, Persian and Tartar astrologers had also constructed huge instruments guided by the notion that "the only bar to accuracy of observation was the limit imposed by circumstances on the size of the instruments". Jai Singh, however, is credited with showing a very considerable ingenuity in the actual constructions. For example, in the plane of the equator and thus secures "in the simplest of manner, equal hours throughout the year". The Muslim astronomers, on the other hand, employed the horizontal plane for the shadow traces, *ibid,* pp.86-87.

[73] A French scholar, and author of many mathematical works including Tabulae Astronomicae (1702 A.D.), and John Flamstead (1646-1719 A.D.), the First Astronomer Royal of the Britain at Greenwich.

[74] This book is available (Nos.84-85) in *Pothikhana*. City Palace, Jaipur.

[75] He was educated at Cambridge University and in 1677 became Member of the Royal Society. His work *Historica Britannica,* which is in three volumes, was studies by the great scientist and mathematician, Sir Isaac Newton and his colleague Edmond Halley. They got it publish in 1725 A.D., after complete observations edited by Helley, *Encyclopaedia Britaninca, 2004.*

Flamstaead had adopted several new methods of investigations[78]. He devised a new method for the determination of the co-ordinates of the first point of Aries and was the first to make use of an accurate time piece and optical means for determining stellar co-ordinates. Consequently, his celestial observations were more accurate than the others. Accordingly to Giorgio Abetti, he was the first to introduce in common usage meridian observations of the right ascension of the sun and stars. He also explained the real principles of the 'equation of time', and he improved the lunar tables by introducing the annual equations[79]. By acquiring Flamstead work, Jai Singh brought himself in touch with the latest developments in astronomical studies in Europe.

Thus, it is clear from the above analysis Sawai Jai Singh had acquired a thorough knowledge of the principles and rules of the science especially of Astronomy and Mathematics after collecting and studying the available subject material of all the three existing traditional schools i.e. the Indian, the Central and West Asian, and the European. After the careful study and comparative analysis, he discovered that there were defects in the astronomical tables which were in use[80]. Therefore, he attempted to prepare new and more accurate tables[81].

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[76] Sharma, V.N., *Sawai Jai Singh and his Astronomy*, Delhi, 1995, p.14; The observatory's purpose was to predict accurately the apparent motion of the moon and fix the position of the stats for the benefit of sailors who wanted to determine their longitude at sea, *ibid.*

[77] Cf. Kaye, *The Astronomical Observatories of Jai Singh II*, f.n.5, p.14.

[78] Flamstead had been assigned the task of finding a precise method for determining longitude. For this he needed stellar catalogues and lunar table, based on better observations then hitherto made by his predecessors for over thirty-three years, he took numerous observations, which are collected in his great work. His 'Celestial History' contains his observations of fixed stars, comets, planets, sun-spots, Jupiter's satellites, and, as noted, a description of the instruments used by him, and Tycho earlier besides the catalogues of the fixed stars of Ptolemy, Ulugh Beg, Tycho and Hevel and the British Catalogue which gives the co-ordinates of 2884 stars.

[79] G. Abetti, *Op.cit*, p.137.

Second stage started with making of astronomical instruments and building observatories, along with taking observations. First, he developed several brass instruments[82], which were failed to attain expected or required accuracy, due to their dimensional defects. Thus, to bring accuracy, he started to build huge masonry instruments, first of all at Delhi. Later on, to verify the correctness of his observations, he constructed instruments of the same type at Jaipur, Ujjain, Banaras and Mathura[83]. These observatories consisted of the most accurate instruments of masonry and metal ever built in India. Out of the five observatories built by Jai Singh, the Jaipur Observatory was the largest, most perfect one, and is still in the well preserved condition. In the words of Joseph Needham,

> "His [Jai Singh's] observatory [Jaipur] is still one of the wonders of the world and it is most interesting to hear of the significance of the Indian passion for accuracy which existed at that time"[84].

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[80] Preface to the *Zij-i-Jadid Muhammad Shahi*, Hunter, W., *Op,cit,* f.190.

[81] Hunter and others say that Jai Singh was chosen by Muhammad Shah to reform the calendar, but probably Jai Singh was the mover and the most obtained the Emperor's formal sanction, Kaye, *Op.cit,* f.n.1, p.8.

[82] For details see Kaye, *The Astronomical Observatories of Jai Singh II, Op.cit,* pp.16-34.

[83] Kaye describes each observatory separately: The Ujjain Observatory is situated in the Quarter known as 'Jaisingha', on the north bank of the river Sipra. Kaye suggests, Ujjain was "one of the most ancient astronomical centers of the world" and "the Greenwich of India", and he suggests setting up of a new observatory which is to be the position of zero longitude for Hindu astronomers. The observatory contains only the 'Samrat Yantra', the 'Dakshino Vritti Yantra', the 'Nari Valaya Yantra', the 'Digamsa Yantra', all in a state of ruin. The Banaras Observatory is built on the roaf of the old part of Manmadir which was built on by Raja Man Singh of Amber. The instruments include the 'Samrat Yantra', the 'Nari Valaya Yantra', the 'Chakra Yantra', the 'Digamsa Yantra', and the smaller 'Samrat Yantra' and two 'Dakshino Vritti Yantra'. Today the value of the observatory is chiefly historical though the instruments can be used, as Kaye suggests (p.66), "for the demonstration of the elements of practical astronomy", for which "a better set of instruments could hardly be devised." Jai Singh built his last observatory on the top of an old fort at Mathura, known as 'Kans ka Qila', which was rebuilt by Raja Man Singh. The whole of it has now disappeared. The only actual, though brief, descriptions of the Mathura Observatory to be found today are of Tieffenthaler and Hunter, cf. Kaye, *The Astronomical Observatories of Jai Singh-II,* pp.61-68.

[84] Rehman, A., *Sawai Jai Singh II and the Indian Renaissance*, New Delhi, 1987 (cited from the "Forward"); Recently, Jai Singh's Observatories have been declared as 'World Heritage' which pacifies Joseph Needham's statement regarding his observatory.

Jai Singh explains the reasons behind building the masonry instruments, some of which, he claims, were of his own invention,[85] and the same instruments or observatories at different places in the following words:

> "...But finding that brass instruments did not come up to the ideas which he had formed of accuracy, became of the smallness of their size, the want of division into minutes, the shaking of the planes of the ancients, such as Hipparchus and Ptolemy, proved inaccurate, most have been of this kind. Therefore he constructed in Daral-Khilafat Shah Jahanabad [Delhi] instruments of his own invention, such as Jai Prakash and Ram Yantra and Samrat Yantra, the semi-diameter of which is of eighteen cubits, and one minute on it is a barely corn and a half-of stone and lime of perfect stability, with attention to the rules of geometry and adjustment to the meridian and to the latitude of the place, and with care in the measuring and fixing of them, so that the inaccuracies from the shaking of the circles and the wearing of their axes and displacement of their centre and the inequality of the minutes might be corrected. Thus an accurate method of constructing an observatory was established and the difference which had existed between the computed and observed places of the fixed stars and planets by means of observing their mean motions and observations was removed.
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> "...And, in order to confirm the truth of these observations, he constructed instruments of the same kind in Sawai Jaipur, Mathura and Banaras and Ujjain. When he compared these observations, after allowing for the difference of longitude between the places where they stood, the observations agreed.
>
> "Hence he determined to erect similar observatories in other large cities[86] so that every person who is devoted to these studies, whenever he worked to ascertain the place of a star or the relative situation of one star to another, might by these instruments observe the phenomenon...."[87]

The third stage i.e. "Theorization", started with arranging the observed data taken from the observatories for a long period of seven years, finding the natural or universal patterns in the movements of the celestial bodies, and then, finally, mathematical predictions of the future's astronomical phenomena (Lunar and Solar Eclipses) by making mathematical equations for their mean motions. He further pointed out the practical requirements[88] for the mathematical predictions or theorization of the movements of celestial bodies to know their future phenomena:

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[85] *Yantraraja-Rachna*, a contemporary manuscript written by Sawai Jai Singh, preserved in *Pothikhana* (Jaipur), gives reference of 15 astronomical instruments which were said to be of Jai Singh's inventions. But, it seems from the Preface of the *Zij* that at least three instruments namely, *Samrat-Yantra*, *Jai Prakash-Yantra* and *Ram Prakash-Yantra* were of Jai Singh's own invention.

[86] The project of building observatories at other places was never carried out.

[87] Preface to the *Zij-i-Jadid Muhammad Shahi,* Hunter, W., *Op.cit*, ff.185-186.

[88] Such as, improvement in the calendar for socio-religious and administrative purposes.

> "...But seeing that, in many cases, it is necessary to determine past or future phenomena, and also that in the instant of their occurrence cloud or rain may prevent the observation- or the power and opportunity of access to an observatory may be wanting- he deemed it necessary that a table be constructed by means of which the daily places of the stars being calculated every year and disposed in a calendar may always be in readiness..."[89]

Jai Singh, to some extent, was aware of the developments in the contemporary Europe in the field of astronomy[90], such as, construction of astronomical observatories there and consistent efforts of European experts to determine with accuracy the subtleties of this science. Accordingly, to find out more information and technical knowledge of mathematical sciences, in the end of 1728 A.D., he sent 'fact finding mission'[91] to Europe, but on its return, he did not satisfy with available astronomical data or tables by which he was mainly concerned So he decided to prepare his own *Zij* or tables, with more accurate observations and mathematical predictions of some astronomical phenomena[92], as he explains:

> "...after having constructed these instruments [observatories], the places of the stars were daily observed. After seven years had been spent in this employment [the regular observations] information was received that about this time [1728 A.D.] observatories had been constructed in Europe[93], and that the learned of that country were employed in the prosecution of this important work, that the business of the observatory was still carrying on there, and that they were constantly labouring to determine with accuracy the subtleties of this science. For this reason, having sent to that country several skilful persons along with Padre Manuel [de Figueredo] and having procured the new tables which had been constructed there thirty years before under the name of Lir[94], as well as the Europe tables anterior to those. On comparing these tables with actual observations, it appeared that there was an error in the former of half a degree in

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[89] Preface to the *Zij-i-Jadid Muhammad Shahi*, *Op.cit*; cf. W. Hunter, f.186.

[90] His limitations, in getting or procuring the source material on the revolutionary scientists, such as Copernicus, Kepler and Newton, are being discussed in a separate section.

[91] Under the supervision of Figueredo, E. Maclagan, *The Jesuits and the Great Mogul* ["The Mission to Jaipur"], London, 1932, pp.133-137

[92] Lunar and Solar eclipses.

[93] Kaye suggests, "In 1728 or 1729 the Reverend Father Figueredo, a Portuguese Jesuit, went to Europe by the order of Jai Singh. Possibly this is the same man."(p.14, f.n.3)

[94] La Hire's *Tabulae Astronomicae,* which was published in 1702. And, it is inferred from this statement that the Preface of "ZJMS" was written in the year 1732 A.D. as Jai Singh got procured La Hire's tables in the same year, thirty years after its publication (1702 A.D.). Though Kaye suggests, "Father Boudier, who went to Delhi and Jaipur in 1734, actually refers to this edition" (Kaye, *Op,cit*, f.n.4, p.14), and so, on its basis, he wrongly concluded that this Preface was written after 1734 A.D.

> assigning the moon's place, and there were also errors in the other planets, although not so great, yet the times of solar and lunar eclipses he found, to come out later or earlier then the truth by the fourth part of a 'ghari' or fifteen 'palas' [six minutes]. Hence he constructed that since in Europe astronomical instruments have not been constructed of size and so large diameter, the motions which have been observed with them may deviate a little from truth."[95]

Jai Singh was apparently confident and well satisfied with the instruments constructed by him and the observations taken, and finally, with the theorization (founded patterns or rules in the motions of celestial bodies) of the observed astronomical data, as he says,

> "Since in this place, by the aid of the unerring Artificer, astronomical instruments have been constructed with all the exactness that the heart can desires and the motions of the stars for a long period been constantly observed with them, agreeable to observations, mean motions and equations were established; he found the calculation to agree perfectly with the observations[96]; And although to this day the business of the observatory is carried on, a table under the name of His Majesty [Emperor Muhammad Shah], comprehending the most accurate rules, and the most perfect methods of calculation was constructed - so that, when the places of the stars and the appearance of the new moons and the eclipses of the Sun, Moon and the conjunction of the heavenly bodies are computed by it, they may arrive as near as possible at the truth, which, in fact, is every day seen and confirmed at the observatory."[97]

III

Before Jai Singh, the Indians had no astronomical instruments of precision of their own, neither were they interested in making practical observations of the celestial bodies[98]. Jai Singh tried to synthesize the existing three schools of astronomy- the Indian, the Central and West Asian, and the European. On the basis of a thorough analysis and understanding of the possibly collected subject material belonging to these schools, he made improvements and innovations in the field of instrumentation, and after taking observations of the celestial bodies for a long time at different places, he prepared the more accurate astronomical tables and tried to find out, more accurately, the patterns in the motions of these bodies so that their future phenomena would be forecasted and the more accurate calendar could be prepared. The organization of observatories was not a whimsical development or a mere copy of the earlier developments but it was a major development of the tradition, with innovative contributions in the fields of instrumentation, ideas and theories. In fact, in India, Sawai Jai Singh was the First Observational Astronomer King, who despite all adverse circumstances, shortage of time, lack of communication, neglect of sharing views of the other scientists, and other factors, contributed greatly in the field of traditional astronomy of the medieval period up to such a level where no astronomer of his category reached before.

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[95] Preface to the *Zij-i-Jadid Muhammad Shahi*; W. Hunter, *Op.cii*, ff.187-188.

[96] Kaye, however, is of the opinion that we should accept Jai Singh's claim about perfect agreement with some caution as we have very few records of his actual calculations, cf. Kaye, *The Astronomical Observatories of Jai Singh-II*, p.13, f.n.6.

[97] Preface to the *Zij-i-Jadid Muhammad Shahi*, W. Hunter, *Op.cit*, ff.188-189.

[98] Cf. Kaye, *The Astronomical Observatories of Jai Singh-II*, p.89.

Mathematical Contribution: Far going analysis has proved that Sawai Jai Singh's contribution was enormous in the fields of both Astronomy and mathematics. A number of scholars[99] have worked extensively on his astronomical achievements, but they have left or ignored his equally important contribution in field of mathematics which is of prime concern presently.

The Europeans of the 17th Century acknowledge the superiority of Indian mathematics[100], and this legacy was carried on by Sawai Jai Singh in the first half of the 18th Century. As already mentioned, Jai Singh had acquired, by constant study and labour, a thorough knowledge of the principles and rules of the mathematical science, and became well acquainted with Indian and Greek mathematics. Up to some extent, Jai Singh was aware of contemporary European developments in the field of mathematics and had acquired various Greek and Arabic works as well as other European texts dealing with subject such as Trigonometry and the use of logarithms, translated into Sanskrit[101].

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[99] For that purpose refer to A.H. Garret & C. Guleri's *The Jaipur Observatory and Its Builders* (1902), G.R. Kaye's memoirs in volume 40 of the new Imperial Series of the Archaeological Survey of India, his short but useful *Guide to the Observatories at Delhi, Jaipur* (1920), and G.N. Sharma's *Sawai Jai Singh and his Astronomy* (1995). These works supersede earlier descriptions like those of Tieffenthaler (C.1745) and W. Hunter (1799).

[100] Frayer, John, *A New Account of East India and Persia, 1672-1681*, (London, 1687), ed. W. Crooke, London, 1909, Vol. II, p.103.

[101] The logarithm, which made calculations easier, was invented by John Nepier of Scotland, and in 1628 the logarithmic tables in the decimal system were published in Holland. The tables were extended soon afterwards to 10 decimal places, making the task of astronomical calculations much easier. Jai Singh acquired a book, *Description and Use of Sector and Other Instruments*, written by Edmund Gunter, which contained the logarithm of numbers, in nine digits, published from London in 1637. The Sawai Man Singh II Museum has a copy of this book. Although the Museum does not give the date of the acquisition of this work, it is certain that it was Jai Singh who acquired it sometime after 1730 A.D. - V.N. Sharma, *Jai Singh-II and his Astronomy*, *Op.cit*, p.11; The most important instrument for calculating is said to have been the sector, a hinged and graduated ruler. The instrument remained in use in one form or other until the 18th century, *ibid.*

He himself wrote a book on mathematics. The book entitled '*Trigonometry and Trigonometry Tables*' is written in Persian and contains many original contributions. It consists of two chapters and tables of trigonometric functions. This is a major contribution, and is similar to the efforts made by earlier scientists, such as Tusi, Al-Kashi and Al-Kuschi. Further more, the use of mathematics in astronomy was not an accident or of limited potential, as would be evident from its extensive use in the planning of the Jaipur City and in the instrumentations i.e. building of the astronomical instruments. Besides, he used mathematics in his Intelligence Service - codification of secret messages, as evidenced from some contemporary documents.[102] Jai Singh developed mathematics to aid and understand observations to put forward abstract ideas, and to formulate theories[103].

Jai Singh's stated purpose had been to determine new planetary constants, but his primary interests in astronomy centered on the Moon and he was more interested in observing and mathematically predicting the positions of this celestial body[104]. The questions he addressed to Boudier [105]around 1731-32 relate exclusively to the moon[106]. He wanted to learn from Boudier the observational techniques, and the hypothesis on which the European astronomers based their calculations of lunar positions in the sky. Boudier had several conversations with Jai Singh and was impressed with Jai Singh's knowledge of astronomy and calls him the most capable astronomer in India. Reporting conversation in a letter to Europe, Boudier writes that Jai Singh was interested then in the prediction of solar eclipses, and in calculation of the occultation of stars, planets by moon[107].

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[102] Codification of the secret messages are evidenced from some of the *Vaqil* Reports of the Jaipur State. In these reports, the secret messages were codified in terms of mathematical numerals which nobody could understand except the person who had the kea of that codification – *Diwani-Hazuri*, Jaipur, file no.28, Bundle No.15, R.S.A., Bikaner; G.S. Sharma, *Sources on Socio-Economic History of Rajasthan*, Bikaner, 2005, p.174.

[103] All these show not only a remarkable understanding of the subject but an acute mind, which is also methodical and systematic.

[104] As it is clear from the Preface to his 'Zij' where he states, "...in order to confirm the truth of these observations....to determine past or future phenomena..." (Referred earlier in the main text).

[105] He was one of the European scientists gathered at Jai Singh's court in Jaipur.

[106] Jai Singh's letter to Boudier, cf. V.N. Sharma, *Sawai Jai Singh and his Astronomy,* pp.299-300.

[107] Fonds Brotier, vol.88; Goerge M. Moraes, "Astronomical Mission to the Court of Jaipur, 1730-1743", *Journal of the Bombay Brach of the Royal Asiatic Society* (New Ed.), V.25, London, 1951, pp.65,85.

Modern scholars[108] have doubted whether Jai Singh was aware of the mathematical developments in the contemporary Europe. From the analysis of the sources, it is borne out that Jai Singh clearly grasped, as mentioned earlier, the advantage of mathematical tools such as the Logarithm, developed in the West, and had the logarithm tables translated into Sanskrit.[109] He appreciated the mathematical knowledge of the Europeans he met. Strobl[110] informs us that he pleased the Raja with his mathematical calculations. He states:

> "I am being of service to him [Jai Singh] in matters of mathematics which is a favourite subject of his, as I have pointed out at greater length earlier. Besides he seems to be pleased with my services to the extent that he gave the emperor Mogol, who invited me to Delhi for the sake of mathematics, a negative answer to two written requests and refused to allow me to leave."[111]

Strobl further informs:

> "Shortly before his death he [Jai Singh] had determined to request to our reverend General Father [head of the Jesuits] to send European priests knowledgeable in mathematics. He would appoint them as the heads of the observatories that were to be established throughout the realm."[112]

Linkage of Mathematics with Natural Science: Trigonometry and trigonometric values developed in India provided a direct link between mathematics and natural sciences, in this case, astronomy. The linkage of mathematics with instrumentation as well as observational astronomy (natural science) is also extremely important, because some scholars have suggested that the main reason for the non-development of scientific tradition in the non-European culture areas was the absence of this linkage. Since such a linkage did exist, it would necessitate looking for factors elsewhere[113].

Jai Singh' Limitations: Despite all his achievements or contributions and innovations in the field of instrumentation, Jai Singh also had some limitations. On one ground, however, Jai Singh's decision to discard brass instruments, which he found faulty because of their mobility and small size, and to make large immoveable instruments of stone and lime of perfect stability, has been criticized by some modern scholars[114]. Though, Jai Singh held the view firmly that no single man, however able, can know all about the science of the celestial bodies and that its knowledge, of necessity, has to be gained through the co-operation of many minds and many observatories. He fully understood the importance of collaboration in the study of the science, and tried his best to gather knowledge from whichever quarter it was to be found. But, as a matter of fact, he did not follow completely the line adopted by the revolutionary European astronomers[115], such as, Copernicus[116], Kepler[117] and Newton[118], and remained dependable to the traditional one (Ptolemy's 'geo-centric' system)[119]. It seems that Jai Singh was not wholly responsible for this and the prevailing circumstances also played a crucial role at the time. Some of these intricacies are pointed out as follows:

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[108] Such as, G. R. Kaye, see for details, *The Astronomical Observatorie of Jai Singh-II*, *Op.cit*, p.89.

[109] Napier's Logarithms was translated into Sanskrit by Kevalram.

[110] He was also belonged to the group of scientists which was invited by Jai Singh from the Europe.

[111] Stocklein, Neuve weltbott, No.643, E Maclagan, *The Jesuits and the Great Mogul*, London, 1930, pp.133-134; cf. V.N. Sharma, Sawai Jai Singh and his Astronomy, f.n.1, p.313.

[112] Stocklein, Neuve Weltbott, *ibid*, No.644.

[113] Particularly, the problem of institutionalization of the scientific knowledge in India which will be dealt in the next section on the limitations of Jai Singh.

(1) By the time Jai Singh became acquainted with the progress made by the European astronomers, he had already partially carried out his own scheme of astronomical research, and considerable work had been done on his tables

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[114] By doing so, Kaye says, "He stereotyped his designs, and hinders further improvements. The larger and more immobile an instrument is, the greater is the difficulty in making alterations and improvements. Jai Singh sacrificed facility for supposed accuracy", Kaye, *Op.cit*, p.35.

[115] The European astronomers were, perhaps, not quite so bound by tradition as were the Indians and the Arabs. The death of the Ptolemaic theory and the invention of the telescope gave a great impetus to research, and the European astronomers largely discarded the methods of their predecessors. They recognized the inevitability of observational error, and devised means to counteract it; they were forced to consider, as of great importance, facility of observation, and gradually they devised instruments of types, unimaginable to their Arabic teachers, Kaye, *Op.cit*, p.85.

[116] He revived the Greek idea of a heliocentric cosmos in his *De Revolutionibus Orbium Coelestium*, published in 1543 A.D.

[117] He expounded the first two laws of planetary motion in *The New Astronomy*, pub. in 1609, and ten years later in 1619, he published his third law of planetary motion.

[118] He published the *Principia Mathematica* in 1687, in which he gave celestial mechanics a solid theoretical footing. In this book Newton described the laws of mechanics and those of universal gravitation, with which orbital motions of celestial bodies could be calculated with great certainty

[119] Kaye suggests, "In the special circumstances of his experience, it is not surprising that Jai Singh refused to follow the lines of research indicated by the European astronomers. Had he done so, his power and his wealth might have enabled him to altered the whole condition of Indian scientific scholarship, and instead of his labours ending with his death, when "science expired on his funeral pyres," there might have been established a living school of research. The troubled condition of the country, and the general state of civilization in it, were antagonistic to the progress of science." - Kaye, *The Astronomical Observatories of Jai Singh-II, Op.cit,* p.90.

with the help of the data given by the Delhi Observatory built a few years previously[120].

(2) Jai Singh's European advisers, who were mostly Catholic[121] priests, did not fully emphasize the importance of the researches of Copernicus, Kepler and Galilei.

(3) More recent European discoveries might have been discredited in Jai Singh's eyes and he would, at any rate, have found it difficult to reconcile the persecution by authority, on the one side, with the claim to brilliant scientific discoveries, on the other[122]. Another reason for this is –till the life time of Jai Singh i.e., before mid-18th Century, the direct benefit or outcome of these discoveries had not been shown in the European societies. For the first time, modern technological developments and its use (mass level production with the help of steam-engines) in the textiles industry started (in England) in the second half of the 18th Century, many decades after the death of Jai Singh.

(4) Also, Jai Singh did not enjoy the same advantages as many of his famous European contemporaries did. Cassini (1625-1712), P. de La Hire (1640-1718), Newton (1643-1727), Flamstead (1646-1719), Halley (1656-1742), Bradley (1692-1762), Godin (1704-1740), T. Mayer (1732-1762) and many others had the advantages of sharing each other's researches, and among some of them there was close collaboration, and also they had the benefit of great work done by their illustrious predecessors, especially Kepler and Galilei, and enjoyed advantages of such bodies as the French Academy of Science and the Royal Society, on the other hand, Jai Singh had to carve out his own path. In the European countries, these scientific societies played a very positive role in institutionalizing the modern or new scientific knowledge at the mass level. The scientific renaissance, which started there centuries before, already provided the basis and platform for spreading this knowledge, while in the non-European countries including India, there was

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[120] Kaye, *The Astronomical Observatories of Jai Singh-II Op.cit,* p.89.

[121] Condemnation of the correct teaching was not confined to the Roman Catholic Church. See De Morgan's *A Budget of Paradoxes*, in which numerous works opposing the 'Newtonian theory' are quoted, Kaye, *The Astronomical Observatories of Jai Singh-II, ibid,* f.n.1, p.90.

[122] Ibid, p.90.

almost complete absence of such kinds of organizations which could help in spreading the scientific knowledge at the mass level.

(5) In India, astronomical research had virtually remained at a standstill for the past many centuries and after the *Surya-Siddhanta* nothing substantial had been achieved by the Indian astronomers, nor after the death of Ulugh Beg had the study of scientific astronomy in the Islamic world made any progress. In a way Jai Singh had to bridge a long gap in the field of astronomy in India. In Europe, on the other hand, fundamental changes had followed in the wake of the Greek's revolutionary 'Helio-Centric' theory of cosmos revived by Copernicus (1473-1543 A.D.).

There is no doubt that instead of relying solely on the Ptolemaic system i.e. 'Geo-Centric' theory of cosmos, Jai Singh tried his best to obtain information about the latest researches in Europe where the researches of Cassini, Halley and Newton were about to open new horizons in the knowledge of this science. Looking to the fact that Jai Singh could devote only a very small portion of his time to the study of astronomy, unlike his great contemporary figures in this field in Europe, his five observatories, the variety of instruments therein[123], and the astronomical studies made under his patronage and supervision, render his achievement remarkable even by most stringent standards. His observatories were undoubtedly the best built in India till his time and many of his instruments were indeed unique. Though only of historical value today, showing as they do a significant phase in the development of astronomy in India, these observatories and the various instruments constructed by Jai Singh are, to quote Kaye, an appropriate monument to "one of the brightest intellect of India"[124].

In the words of Joseph Needham, "...This great ruler [Sawai Jai Singh] was a man of many parts, but is perhaps famous throughout the world for his astronomical observatory ...with many instruments constructed in massive masonry. This may still be seen in Jaipur today. His observatory is still one of the wonders of the world, and it is most interesting to hear of the significance of the Indian passion for accuracy which existed at that time..."[125] Estimating Jai Singh's work, Kaye indeed pays a truly fitting tribute as he says: "That Jai Singh made no new astronomical discoveries is hardly a fair criterion of the value of his work; for indeed, a great deal of the most valuable astronomical work is not concerned with new discoveries. His avowed object was the rectification of the calendar, the prediction of eclipses, and so on- work which entails a great deal of labour, and generally shows no remarkable achievement. Considering the state of the country in which Jai Singh lived, the political anarchy of his time, the ignorance of his contemporaries, and the difficulty in the way of transmission of knowledge, his scheme of astronomical work was a notable one, and his observatories still form noble monuments of a remarkable personality."[126] The good start made by Jai Singh and the significant works done by the scholars he gathered at his court came to an abrupt end at his untimely death in 1743 A.D.

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[123] Which in Tod's words, "irradiate the dark epoch of the history of India"- Tod's *Annals and Antiquities of Rajasthan*, V.II, p.291

[124] Kaye, *The Astronomical Observatories of Jai Singh-II, Op.cit,* pp.59-60.

The Problem of Institutionalization of the scientific learning in India and Jai Singh's efforts in this field: Though, the institutionalization of scientific knowledge was there, as Jai Singh tried his level best by constructing and organizing astronomical observatories at five different places, it was not at the mass level which is the basic and first pre-requisite condition for the scientific advancement in a country or region. It seems that Jai Singh was realizing this fact i.e. the basic requirement of institutionalizing the scientific knowledge (here astronomy) at the mass level, as it is clear from the Preface to his *Zij-i-Jadid Muhammad Shahi*, he planned to build many observatories at different big cities in India:

> "Hence he determined to erect similar observatories in other large cities so that every person who is devoted to these studies, whenever he worked to ascertain the place of a star or the relative situation of one star to another, might by these instruments observes the phenomenon..."[127]

Strobl confirms the future planning of Jai Singh regarding establishment of new observatories on a large scale throughout the Empire. He, as stated earlier, informs:

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[125] Rehman, A., *Maharaja Sawai Jai Singh and Indian Renaissance*, Navrang, New Delhi, 1987, preface.

[126] Kaye, *The Astronomical Observatories of Jai Singh-II, Op.cit*, p.90.

[127] Cf. W. Hunter, f.186.

> "Shortly before his death he [Jai Singh] had determined to request to our reverend General Father [head of the Jesuits] to send European priests knowledgeable in mathematics. He would appoint them as the heads of the observatories that were to be established throughout the realm."[128]

Unfortunately, due to many unfavourable circumstances, Jai Singh could not succeed in his future project of building new astronomical observatories in India on a large scale or in other words, his plan of institutionalizing scientific learning at the mass level could not materialized. On the other hand, Jai Singh's contemporary European astronomers who were the outcome or the product of a society where the institutionalization of the modern revolutionary scientific knowledge at the mass level had already been taken place centuries before during the period of renaissance.

Thus, problem of institutionalization i.e. the lack of mass-level institutionalization of the scientific knowledge was the main degenerating factor behind scientific and technological backwardness in the non-European countries including India, during the pre-modern period. Jai Singh had realized this fact, as he took initiative to establish the astronomical observatories at five different places, and further, tried to institutionalize this scientific learning- mathematical science- on the mass level in India by making plans, though which could not be materialized, for establishing a large number of observatories throughout the Mughal Empire. But unfortunately, due to many unfavourable circumstances in the Indian scenario, the good start, made by Jai Singh and the learned scholars he gathered around him, came to an abrupt end after his death in 1743 A.D., as Todd comments on his death, "His wives, concubines and the science expired with him on his funeral pyre."[129]

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[128] Stocklein, Neuve Weltbott, No.644; cf. E Maclagan, *The Jesuits and the Great Mogul*, p.134.

[129] Cf. JamesTodd, *Annals and Antiquities of Rajasthan*, Vol.II, p.368.

CHAPTER FIVE

EMERGENCE OF THE CITY AS A COMMERCIAL HUB

From the epigraphic and literary sources it appears that trade and commerce were well developed in the Jaipur State, even before the foundation of the new Capital City of Jaipur. Amber Records show that before the foundation of the Jaipur City, Amber was a flourishing centre of trade and the cardinal relation with Mughal Emperors added to its importance and helped it to become a prosperous commercial city during the period of Mughal Empire. The existence of a large number of commercial groups, such as, *Kothiwals* i.e. merchants and bankers in Amber town is an indication of its trade and commercial activities carried on a high scale[1]. The route from Delhi to Ahmadabad passed through Amber and connected it with Ajmer and Udaipur. It was a market of precious stones, such as, emerald, diamonds and pearls[2], clothes of various kinds, such as, *Masru, Marmug*, Silk, *Dusala, Tafta, Mukhmal, Selo, Khamp-khap, Saris*, White Clothes, Turbans, Cloth of *Zari* and Stone Statues[3].

As the contemporary records show, within a few years after its foundation, the City of Jaipur emerged rapidly[4] and became a big commercial hub of the northern India during the period under review, from its foundation in 1727 A.D. till the death of Maharaja Sawai Jai Singh in the mid-18th Century. Besides being a leading centre of transit trade and flourishing market and an important centre of manufacturing in various articles, viz, woolen clothes and fabrics, *gota-kinari*, pottery, enamel work on gold, silver and brass[5], Jaipur was renowned for 'Banking and Exchange' operations[6]. Just after the foundation of Jaipur, a large number of merchants, artisans and bankers were invited by the State from different parts of Rajasthan and other regions of the country. They were provided various facilities, incentives; safety and security by the government[7] to settle down in the City and do their business here.

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[1] *Chitthi* or Letter from *'Diwan* Kalyan Das to Shah Man Singh, Ram Singh and Dwarka Das' dated *Phalgun Vadi* 13, V.S.1721/1664A.D., Amber Records, Shah Man Singh, Ram Singh, Dwarka Das, Bhaiya Chabila Ram and Shah Hemraj are mentioned as the famous bankers of Amber (Letter No.29/227); *Chitthi* from '*Diwan* Kalyan to Bhaiya Chabila Ram and Shah Hem Raj' dated *Magha Sudi* 10, V.S.1721/1664A.D., Letter No.17/215, Amber Records, Rajasthan State Archives (R.S.A.), Bikaner.

[2] *Siyah-Rukka* (Jaipur), *Chait Badi* 15, V.S.1784/1727A.D., Jaipur Records, R.S.A., Bikaner.

[3] *Kirkira-Khana* (Jaipur), V.S.1796/1739, Jaipur Records, R.S.A., Bikaner.

[4] Girdhari's *Bhojnasar*, (*Doha* or Verse Nos.199, 200), written in Sanskrit in 1739 A.D., its relevant portions along with the translation were published by P.K. Gode in his essay "Two contemporary Tributes to Minister Vidyadhar, the Bengali Architect at the court of Sawai Jai Singh of Amber (1699-1744 AD)", in Dr. C.K. Raja Presentation Volume, Madras, 1946; Bakht Ram Saha's *Budhivilas* (Stanza No.112), written in Jaipuri dialect, published by Rajasthan Oriental Research Institute, Jodhpur, 1964; cf. A.K. Roy, *History of the Jaipur City*, Appendix VII, pp.233-237; Shri Krishna Bhatta's *Ishwarvilas-Mahakavyam*, written in Sanskrit in 1749 A.D., pub. by Rajasthan Oriental Research Institute (R.O.R.I.), 1958.

[5] *Dastur-Kaumbar*, Vol.3, ff 42, 45, 395, Vol.4, ff 321, 323, 341, Jaipur Records; *Imperial Gazetteer of India*, Oxford, 1908, p.244

[6] Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century*, Jaipur, 1987, p.112; Banking and transaction in the Jaipur City continued to remain important in the 19th Century, as it is clear from

I

Jaipur was linked with important trade centers of India as well as Rajasthan[8], such as Sindh, Multan, Shikarpur, Kabul, Surat, Gwalior, Kota, Pali, Ajmer and Bikaner by the following trade routes[9]:

1. Jaipur to Multan via Churu, Bikaner, Pugal and Bahawalpur
2. Jaipur to Sindh via Churu, Bikaner and Jaisalmer
3. Jaipur to Shikarpur via Parbatsar, Maroth and Jothpur
4. Jaipur to Gwalior via Karauli
5. Jaipur to Hyderabad via Bundi, Kota and Ujjain
6. Jaipur to Kota via Tonk, Deoli and Bundi
7. Jaipur to Surat via Jodhpur
8. Jaipur to Jodhpur via Sambhar, Parbatsar and Merta
9. Jaipur to Pali via Parbatsar and Naraina or via Maroth and Jhadond[10]
10. Jaipur to Surat via Ajmer, Bhilwara, Udaipur, Dungarpur, Ahmadabad and Surat[11]

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the British Resident's report of 1869-70 on Jaipur, the Resident said: "Jaipur is as it were a sort of Lombard street of Rajputana", cf. A.K. Roy, *History of the Jaipur City*, New Delhi, 1978, Pref., p.viii.

[7] The State's policy towards the various commercial groups will be dealt in detail in the last section of this chapter.

[8] See figures 3 & 4, Map of Trade-Routes, pp. 138, 139; Since the early medieval period there were several routes in Rajasthan connecting important local towns and the neighbouring provinces. The epigraphic sources mention that *Madhya Desh*- region lying between the Himalayas on the North, the *Vindhyas* on the South, Sindh on the West, Prayag on the East was connected with almost the whole of Rajasthan. As a result of agricultural and industrial development after the advent of the Turks, new commercial marts and new trade routes came into existence, and so the trade in Rajasthan expanded during the medieval period B.L. Gupta, *Trade and Commerce in Rajasthan during the 18th Century Op.cit*, p.129.

[9] The old records of Rajput states show that commercial cities like Pali, Jodhpur, Phalodi, Marta, Bhilmal, Sanchare, Nagore, Jaisalmer, Pugal, Rajgarh, Rini, Bersalpur, Rattangarh, Rajaldesar, Bikaner, Bikupur, Deravar, Amber (Jaipur), Sambhar, Malpura, Sanganer, Ajmer, Kota, Bundi, Sirohi, Udaipur, Chittor, Bhilwara, Bakral and Sironj were interlinked with each other, *ibid.*, p.110.

[10] Illiot and Dowson, *History of India- As Told by Its Own Historian*, Vol.VI, p.397.

The above mentioned routes are an indication of Jaipur being connected with the other states of Rajasthan and various provinces of India like Multan, Sindh, and Kabul in the West, Punjab Kashmir in the North, Delhi and Agra in the North-East, and Gujarat, Malwa, Burhanpur and Hyderabad in the South. The trade routes were helpful in the growth of both internal and external trade of the Jaipur and other states of Rajasthan, during the period under consideration. It was because of these routes that the traders could frequently move with their goods, not only in Rajasthan, but in other parts of India[12].

So far as the mode of transport[13] was concerned, the beasts of burden, such as, camel, horses, bullock and ponies were being used. In the Western Rajasthan, rain-fall being scanty, the camels, loaded with merchandise plodded over the vast stretch of dunes. The oxen and ponies were employed to carry goods onto marshy routes in South-Eastern Rajasthan[14]. The community of *Rebaris* was mainly engaged in the profession of camel transport. Not only the traders, the government also hired camels of the *Rebaris* for transport[15]. Besides *Rebaris*, *Banjaras* occupied an envious position as carriers of merchandise, especially food-grains and salt. They carried wheat, rice, sugar, ghee, grocery goods from one place to another with great care. The salt from Sambhar was carried by the *Banjaras* on a large scale to the different part of Rajasthan as well as out side[16]. Like the *Banjaras*, the *Charans* and *Bhats* were also engaged in the profession of transport. They took advantage of their sacred character to become general carriers of goods in the country[17].

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[11] *Chitthi* or Letter from 'Maharaja of Udaipur to Sawai Jai Singh' dated *Bhadrapad Sudi* 11, V.S.1784 /1727 A.D., *Draft-Kharita* and *Parwana*, Jaipur Records, R.S.A., Bikaner.

[12] Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century, Op.cit*, p.136; There was a heavy flow of goods to and from the neighbouring provinces of Panjab, Delhi, Agra, Malwa, Gujarat, Sindh and Multan, *ibid*, p.129.

[13] The means of transport was determined by the nature of land. The routes ran through the narrow strips of dry land surface and were unmetalled and tortuous. Some of the routes were wide enough to let the wheeled vehicles move easily, except during the rainy season. The movement of light goods was not however, substantially affected due to rain-fall.

[14] Cf. Gupta, .B.L., *Trade and Commerce in Rajasthan during the 18th Century*, p.129

[15] Ibid, p.141

[16] Ibid, p.142

[17] Todd, *Annals and Antiquities of Rajasthan*, Vol.I ,London, 1829, pp.554-555.

From the *Nirakh Bazar's Reports*[18] of Jaipur, we came to know that the 'items of transaction' in the main markets of Jaipur were generally rice, wheat barley, wheat flour, ghee, oil, *til, jawar*, moth, *bazra, moong urad, khand*, sugar, shaker, *gur*, salt, maize, *moong dal, urad dal*, gram, *besan* (grain flour), *arhar*, etc[19]. As it is mentioned in the contemporary records of Jaipur[20], the general 'articles of inter-state trade' were cloth, tobacco, food-grains, ghee, opium, woolen cloth, lead, carpets, arms, candy, sugar, etc.

In the Mughal period Ajmer, Nagor, Merta and Chittor served as links between the Mughal territories in the North and South. Products of Kashmir, China, Europe, Africa, Persia, Arabia, Cutch, Malwa, Gujarat, Sindh and Multan were sold and interchanged at Pali, Ajmer, Jaisalmer, ete., and were brought to Jaipur from these centres[21]. The 'articles of imports' were ivory, copper, dates, gum Arabic, borax, spices and coffee[22]. Oxen were imported from Malwa, Multan, horses from Sindh, Kandhar and Arab, Elephants from Kutch[23]. 'Items of export' were cloths, brass and iron utensils, indigo and marble sculpture from Jaipur[24].

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[18] Reports of daily market-rates.

[19] *Nirakh-Bazar* Reports of Jaipur City (Manak-Chowk Market) for the years V.S.1784/1727 AD, 1785/1728 AD & 1790-95/1733-38 AD, and the reports from markets outside the City {*Pargana* Sanganer, V.S.1782, 1784; Chatsu, V.S.1781, 1789, 1794; Ghazi-ka-Thana, V. S.1784-87; Hindaun, V.S.1786; Baswa, V.S.1778 and 1785; and Malarna, V.S.1779, 1802} preserved in the Rajasthan State Archives, Bikaner; cf. A.K. Roy, *A History of the Jaipur City*, Appendix IV, "Prices of Food grains", pp.208-210.

[20] *Chithi-qarar* (Jaipur), *Hasil-Dastur-Rahdari* (Jaipur), V.S.1767/1710 AD; *Siyah-Haqiqat*, *Pargana* Toda-Bhim (Jaipur), *Chait Sudi* 1, V.S.1790/1733AD.

[21] *Nainsi-Ri-Khayat*, Vol.II, p.500: Tod's *Annals*, *Op.cit*, Vol.II, p.25; G.C. Sharma, *Administrative System of the Rajputs*, *Op.cit*, p.167.

[22] Todd's *Annals*, *ibid*, pp.27-28

[23] Girdahri's *Bhojanasar*, *Op.cit*, (*Doha* or Verse Nos.197, 199), describes the business of the Jaipur City,

> "Elephants, Arabic horses, camels from Kutch, bullocks and buffaloes are being brought and sold. In this beautiful town built by the Rajadhiraj [Sawai Jai Singh], embroidered cloth from many countries, plain cloth and jewelry are being transacted"

[24] *Siyah-Haqiqat* (Jaipur), *Asoj Badi* 2, V.S.1783/1726AD; *Siyah-Haqiqat* (J), *Pargana* Hingaun, *Chait Badi* 8, V.S.1788/1731AD; Tod's *Annals*, *Op.cit*, p.278.

TRADE ROUTES OF JAIPUR (WITHIN THE RAJPUTANA) DURING THE18TH CENTURY

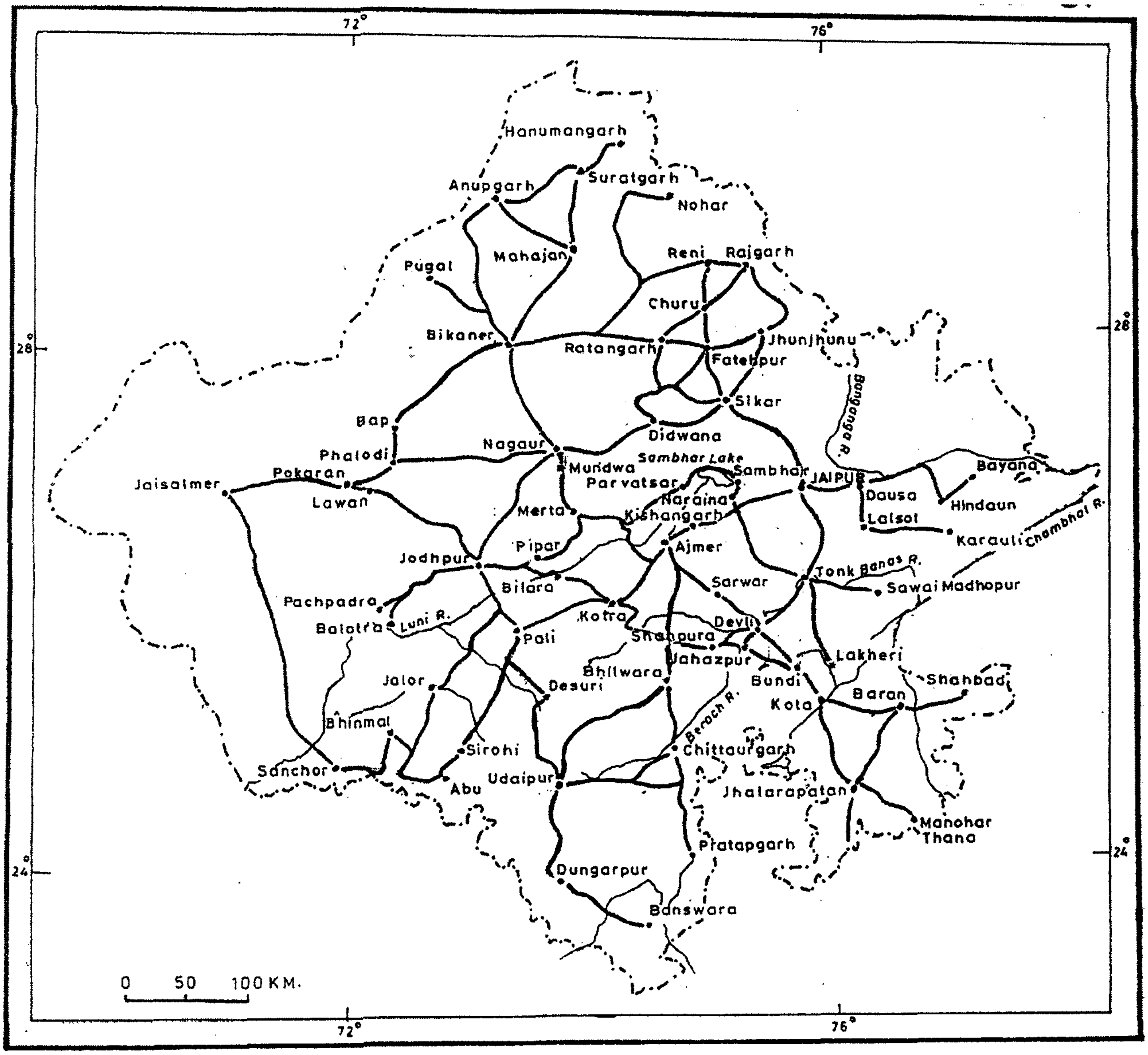

Fig.3

EXTERNAL TRADE ROUTES OF JAIPUR DURING THE 18TH CENTURY

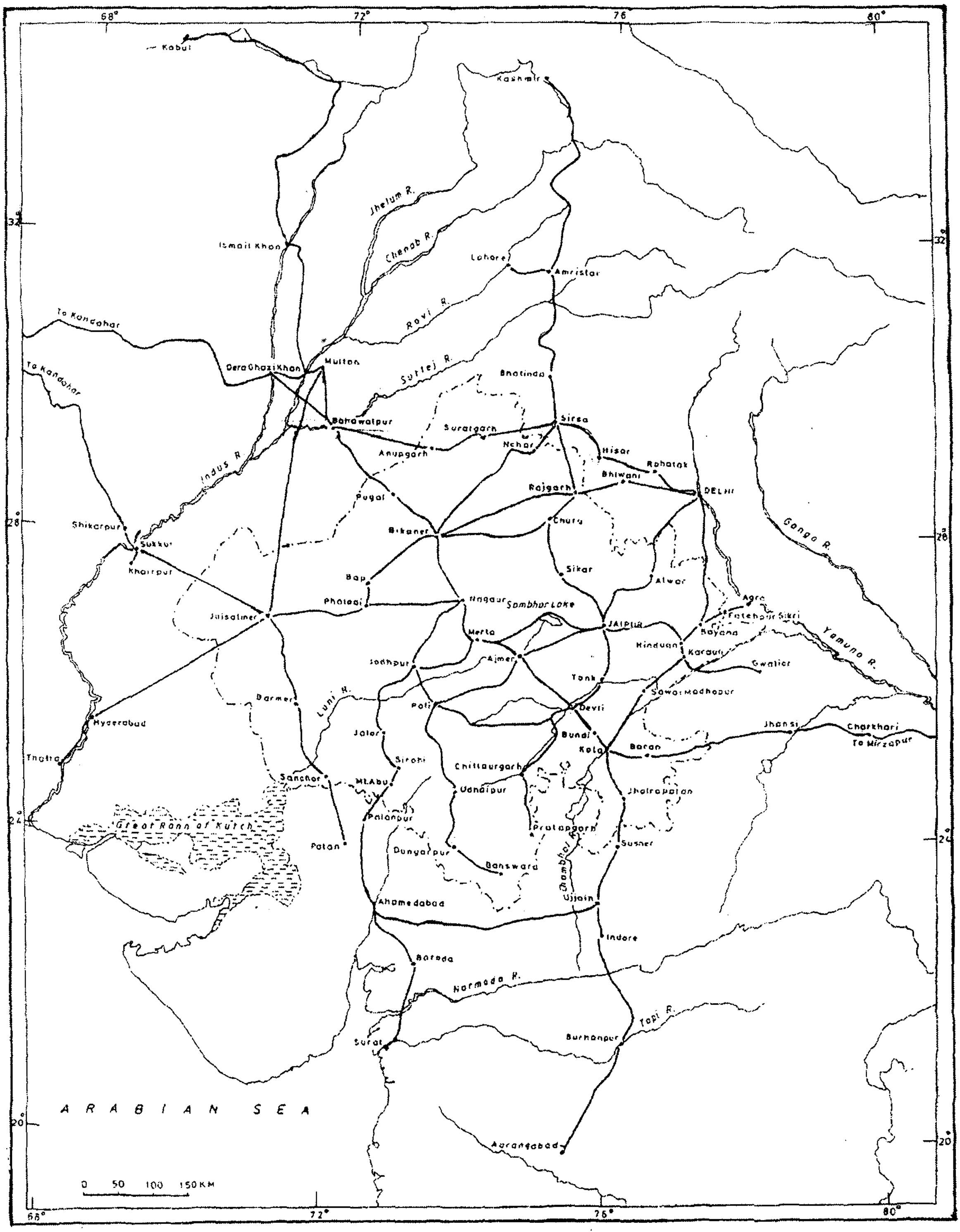

Fig.4

II

The economic conditions in a city would be to some extent related with the social and caste structure of the population. From the arrangement of space organization in the Jaipur City, it is evident that different sections or residential blocks of the city were reserved for different groups of society according to their socio-economic status and their profession. Some contemporary records[25] and later sources[26] also justify the same arrangement in the City. This pattern, up to some extent, is still maintained in the city, and even some localities and streets of the city are known by their castes and professions. There are separate localities or streets, such as, *Lakhara-Gali, Maniharon-ka-Rasta, Silawato-ka-Muhalla* for craftsmen in the city, and *Brahmapuri* a famous separate colony for the scholars and scientists which is still known by this name.

The socio-economic structure of society may be classified under three broad categories: (A) Producing Class, (B) Distributing Class, and (C) Consumer Class. The producing class comprised of – (i) Peasants and (ii) Artisans and Craftsmen: Goldsmith, Blacksmith, Carpenters, Potters, Tailors, *Kalals, Chamars* (shoe-makers), *Chhipas* (calico printers), *Rangrejs* (dyers), *Lakheras, Churigars, Julahas* (weavers), *Pinjaras, Patwas, Theteras, Shorgars, Gandhis,* Masons & Sculptors, *Telis,* etc. The distributing class comprised of – Traders and Brokers: *Mahajans, Banjaras, Charans, Bhats* and other castes outside traders. And, the consumer class consisted of – Royal House-hold, Aristocratic Classes, Lower Officials, Religious Class, Servants & Slaves, *Charans* and *Bhats,* Untouchables, etc.[27]

Two sets of statistical tables are available which provide us information on the socio-caste structure of the population of the City of Jaipur. The first is a set of tables which were prepared by Boileau, an officer of the Survey of India, who passed through Jaipur in 1835[28]. He gives the number of houses occupied by each caste and profession living in the city. Scholars[29] agreed with Boileau's assumption that each house had the average five residents. But the total number of houses[30] in the city, which he counted to be about 80,000, was many times greater than the probable figure. So, the number of persons of each caste and profession estimated by Boileau is not reliable, but some reliance can be placed on the figure of relative strength of those castes and professions. According to the Boileau's tables, the *Banyas* (*Jainas*)[31] and the *Brahmans* constitute about 45% (*Brahmans* ~25% & *Baniyas* ~20%) of the City's total population[32]. The second set of tables on this subject is available in the census report of Jaipur for the year 1901[33].

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[25] *Rojnamcha-Potedar* (Jaipur), V.S.1783/1726AD, it shows the rectangular town planning and space organization of different sectors for different groups of the society according to their socio-economic status in the Jaipur City, which was in the founding process at that time.

[26] Todd's *Annals*, Vol.II, *Op.cit*; Shyamaldas' *Vir-Vinod*, compiled in 1875 A.D., printed by the Mewar State in four volumes in 1886, Vol.II, p.1262; R. Heber's travelogue, "Narrative of A Journey Through the Upper Provinces of India, 1824-25", Vol.II, London, 1828, pp.414-415.

[27] The status and functioning of some of these socio-economic groups of the society is being discussed in a section on the marketing system of Jaipur.

[28] Boileau, *Personal Narrative of a Tour through the Western States of Rajwara in 1835*, pp.232-235

An analysis of these two tables is of significance from different points of view. First, an idea of the social structure of an Indian town in the pre-modern age or Pre-British period can be formed. People of various professions such as horse doctors or elephant drivers or bangle makers were required to meet the needs of the richer sections of the society. The tables also give an idea of the economic life of people. It appears that a very large number of people were either traders (among whom the majority was that of *Jainas*) or *Brahmans*. These tables show the *Brahmans* and the *Baniyas* or *Jainas* were the two main dominating castes of the Jaipur City and they constituted about half of the City's total population[34]. These tables help us in understanding the 'relative positions' of different socio- caste groups in the society of the Jaipur City.

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[29] Roy, A.K., *History of the Jaipur City*, *Op.cit*, Pref. xi

[30] He did not mention the basis of his assumption on which ground he counted the number of houses in the City.

[31] Who were mostly traders, merchants and money lenders, played a very dominant role in the administration of Jaipur. A.K. Roy writes, "With the administration of the state firmly in the grip of their own community, the *Jaina* merchants no doubt found the conditions in Jaipur very satisfactory. But the important point to note is that Jaipur City had business enough to engage a very large number of merchants." - Roy, *History of the Jaipur City, Op.cit*, p.57.

[32] Other castes and groups in the Jaipur City were: Muslims- 17% (*Chipis* i.e. Printers- 4.3%, *Haqims*- 1.67%, *Chejara* i.e. Mesons-1.65%, Distilers-1.65%, Weavers- 1.0%, *Sukkas*- 0.57%, *Rangrej* i.e. Diers- 0.35%, were exclusively Muslims and other classes, such as, artisans and craftsmen and soldiers and some other classes were also belonged to this community but their proportion was very less), *Kaith* (writers)-3.5%, *Rajputs*- 2.85%, *Malis* (gardeners)- 2.85%, *Kusbee/Pathur*-1.63%, Tailors-1.5%, *Jats* (Cultivators) -1.45%, *Kusara* (Braziers)- 1.45%, Sonar (Goldsmiths)-1.3%, *Kahars*- 1.13%, *Pewandee*-1.3%, *Kahars*-1.14%, Sweepers-1.0%, Stone Cutters-0.86%, *Aheers* (Watchmen)-0.86%, *Thathera* (Brass Smiths)- 0.53%, *Chamars* (Cobblers)- 0.7%, *Gujjars* (Cow-herders)- 0.7%, *Kumhars* (Potters)- 0.7%, *Naee* (Barbers)- 0.7%, *Kunjars*- 0.63%, *Chakurs* (Servants of Thakurs)-0.63%, etc. See fig. 5, p. 141.

[33] *Imperial Census Reports*.

[34] There are some evidences which show that Brahmans were mostly engaged in priestly duties and many of them had *jagirs* (religious, *inam-jagirs*), and some of them, such as, Vidyadhar, an engineer, architect and the States' *Desh-Diwan*, played an eminent role in the State's administration and even many of them were involved in the mercantile activities, but in any case, it seems, they were not employed in any manufacturing work.

Relative distribution of the Jaipur City's estimated population (50,000) during the mid 18th Century

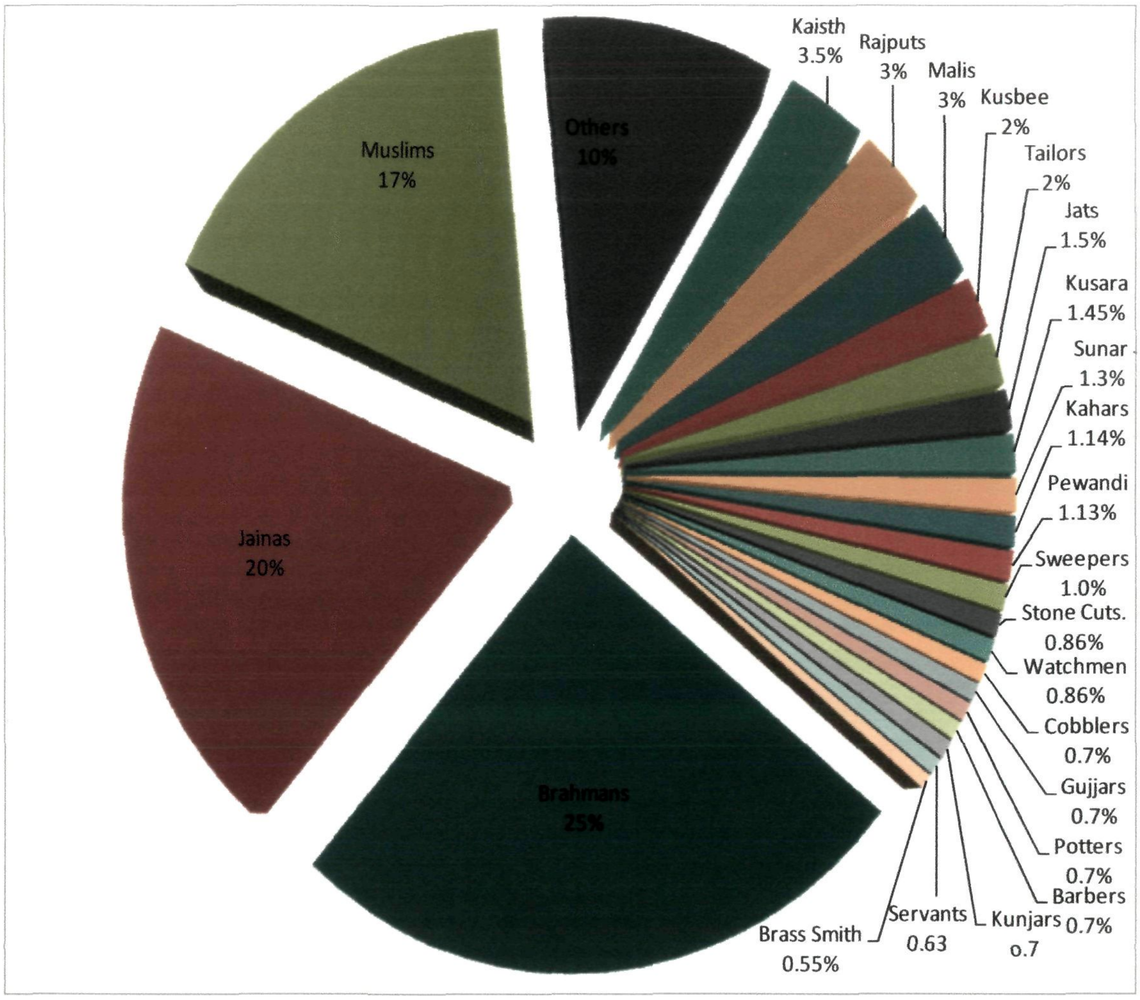

Fig. 5

Estimation of the City's Population[35]: In the absence of any contemporary record or data regarding the total population of the Jaipur City in the period of Sawai Jai Singh, the City's population could be computed with the application of two methods. Firstly, with the help of Boileau's tables, the proportion of the population of the Jainas or Baniyas in the City was about 20 percent; and as per a 'Circular Invitation' letter[36] for a *Jaina* festival issued by the prominent *Jainas* of Jaipur in 1764 A.D., the approximation of the total population of the *Jaina* merchants in the Jaipur City during that period, is given as 10,000. If the Jainas' population i.e. 10,000 could be taken equal to 20% of the City's population, the total population of the Jaipur City would be estimated 50,000[37].

Secondly, by adopting another exercise, the City's population could be calculated by the use of Census Reports of the Jaipur City and its population growth rate. The census report of 1881 gives the population of the Jaipur City as about 1,50,000 and if we see the next consecutive census reports of 1891, 1901 and 1911, we find the 'average decadal growth rate' of the City's population to be about 10 percent. For the sake of convenience, it could simply be assumed that this decadal growth rate would be static even in the previous century, and 1881 as a base year, then proceeding backward[38] from

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[35] The Jaipur City's population is estimated with the help of some contemporary documents, travelers accounts, Boileu's table and Census Reports of the Jaipur City (1881,1891 and 1901).

[36] There is a circular invitation letter for a *Jaina* festival dated Feb. 1764 issued by the prominent *Jainas* of Jaipur. This letter though not directly referring to the prosperity of Jaipur shows approximate strength of the *Jaina* merchants in the City and with what smug satisfaction *Jaina* businessmen used to find the conditions here. The letter was issued to the *Jainas* of Delhi, Agra, etc, with requests to send copies of the invitation to *Jainas* in other towns. The purpose of invitation was to request them to attend a religious celebration called the *Indra-dhwaj-puja*, which was held on a huge platform constructed near 'Moti-Dungri' in Jaipur. The letter stated that the Raja of Jaipur and two of his *Diwans*, Ratan Chand and Balchand (of the *Tara-Panthi* Sect) were helping in the celebrations by financial and other contributions. About Jaipur this letter says (cf. A.K. Roy, *History of the Jaipur City*, p.57):

> "About this city, it lacks several things that is to say, in this city you would not find wine sellers, butchers and prostitution. Also killing of animals is prohibited. The Raja's name is Madho Singh. In this Kingdom you would not find sinful activities which are prohibited by the Raja. And there are many *Jainas* resided here. All important courtiers are *Jainas*. And all the merchants are Jainas. Though, there are others too, but they are in minority, not in majority. Six, seven or eight or ten thousand *Jaina* merchants have their residents here. In no other town you would find so many *Jainas*."

[37] Let suppose, the total population of the city be X, and as we are given, the total strength of the Jaina merchants in the city was about 10,000 which is ~20 % of X, then, X = 10,000*100/20=50,000.

[38] Calculating every decade's population, mathematically, by the reduction method.

1881 to 1871, 1861, 1851, and so on, till 1751. From this method too, the estimated population of the Jaipur City, in the mid-18th Century, also comes out to be about 50,000.

Since the estimate of the Jaipur City's population in the mid-18th Century, calculated from two different methods, comes out to be equal i.e. 50,000, thus it seems to be near about the probable figure[39].

III

Market, an integral part of a city, was an important segment of Jaipur. The marketing system i.e. markets and their organization[40] of the Jaipur City could be studied under the following heads:

(A) Markets and their types –*Hats* or weekly markets, *Mandis*, Fairs.

(B) Organization of the Markets – Whole-sellers, Retailers, *Dalals* or Brokers, *Kayalis* or Weigh- men, *Palledars* or Porters, Pedlars.

There were different types of markets, such as, *Hat Bazars* i.e. the weekly markets, *Mandis* i.e. special markets and Seasonal Fairs which were organized regularly. These were the places where the sale & purchase or transaction of different kinds of commodities took place. *Hat Bazars* were organized at Jaipur and its towns, meant to provide facilities for sale & purchase to the people. These markets occupied an important place in the local trade of Jaipur. Fortunately, a very contemporary source of Sawai Jai Singh' period, *Bhojanasar* of Girdhari, gives a clear reference of organization of these weekly markets or *Hats* and a large number of shops and their functioning in the Jaipur City[41]. These weekly markets were held on a fixed day where shop-keepers and artisans of the town and nearly villages, brought goods for sale. The vendor and shop-keepers travelled from place to place with their goods. Reasonable concessions and facilities to the shop-keepers were provided by the Sate. The people of the adjoining areas came in large numbers to purchase these goods. Sale-taxes, namely, *Baitha* and *Inchh* from the seller's were realized by the local officials[42].

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[39] This figure is also equivalent to the total army's strength of the Jaipur State of Sawai Jai Singh.

[40] The Marketing System of Jaipur in the context of regional and external trade was very well organized. The new Capital City had acclaimed the status of an urban centre of production and distribution of Rajasthan in the mid 18th Century.

[41] Girdhari (*Bhojnasar, Op.cit, Doha* or Verse No.196), mentions:

> "There are many cross-roads with shops on them and thousands of *Hat-Bazars* where merchants of different countries are plying their trades."

There were *Mandis* or the special markets in almost all the towns of Jaipur and within the City itself, where grain and other products were brought by traders, *zamindars* or Land-lords and peasants from the adjoining villages on camels or bullock carts for sale. They contrived to sell the goods at the market rates. In Jaipur, there were separate markets for the sale of important commodities, such as *Namak-Mandi* (the salt-market), *Rui-Mandi*[43] (the cotton-market), *Moch- Khana* (the shoe-makers' market), *Johari Bazar* (the jewelers-market), *Bajaj-Khana* (the cosmetics-market), etc. There the traders, dealing in a particular commodity, had both whole-sale and retail shops[44]. There were separate localities or streets, such as *Lakhara-Gali, Maniharon-ka-Rasta, Silawaton-ka-Mohalla, Khazanewalon-ka-Rasta, Nataniyon-ka-Rasta*, etc., for craftsmen in the towns[45]. The craftsmen had their own work-shops, stalls and houses therein[46].

Most of the artisans, big and small, sold their products to the retailers or whole-sellers. Some of the small artisans sold their products directly to the consumers at their residence. Care was taken not only to maintain the commercial importance of old *Mandis* but also to promote new commercial *Mandis*[47]. The main motive of the State, behind all the concessions, facilities and honours to the traders, merchants, artisans and craftsmen, was to establish permanent *Mandis* in the City and its towns to encourage trade & commerce[48].

The City's records show that besides the *Hats* and *Mandis*, Fairs were other agency of local and foreign trade which were held in Jaipur and its towns and lasted several weeks. *Akhatij*, '*Swami Ghasi-Jagannath*' and '*Adhin-Pir*' were important fairs in

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[42] *Baithak* was a tax taken from the sellers who had their stalls in the weakly markets and *Inchh* was a tax to be levied from the vegetable sellers who brought their vegetable for sale in the market, cf. B.L. Gupta, *Trade and Commerce in Rajasthan during the 18th Century*, f. n. 13, 14, p.92.

[43] *Siyah-Huzur* (Jaipur), V.S.1794/1737AD, Jaipur Records, R.S.A., Bikaner; this record mentions names of different places of the newly built Capital City where Jai Singh visited.

[44] Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century*, *Op.cit*, p.79

[45] These localities are still known by these names in the Jaipur City.

[46] Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century*, *Op.cit.*

[47] Sharma, G.C., *Administrative System of the Rajputs*, *Op.cit*, p.157

[48] State-Policy towards the commercial classes is being dealt in a separate section.

Jaipur (Amber)[49]. In these fairs cattle and other merchandise were brought for sale by merchants from different parts of the country – both local & foreign traders participated in them. The people flocked to these fairs to purchase goods of their needs. The role of these fairs in the promotion of regional and inter-regional trade is appreciable.

Realizing the importance of fairs, the State took active interest in the organization of the fairs and some new fairs were started[50]. Some times the ruler visited the fair in order to enhance its importance[51]. Traders from different parts of the Rajasthan and other regions of Country were invited to bring goods for sale. The leading traders were honoured by the King with cash rewards or *Siropaos*. To attract the traders some exemption (25-50%) was given in the local taxes[52]. The government took the responsibility of the security of the traders who brought their merchandise in the fairs[53]. It is thus clear that the State encouraged local as well as foreign trade by organizing fairs at different centers, weekly markets for local needs and established permanent commercial *mandis*. Due to this policy of encouraging trade, the old commercial centers continued to flourish and new ones came into existence.

The markets in the Jaipur City were organized by the following agencies:

(I) Whole-sellers - Local and Regional whole-sellers, *Kothiwals* i.e. Importers and Exporters

(II) Retailers- Shop-keepers, *Pattiwals* i.e. Pavement Dwellers and *Pheriwals* i.e. Peddlers,

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[49] *Arhsatta, Pargana* Amber (Jaipur), Nos.421, 897, V.S.1781/1724AD; *Siyah-Haqiqat*, Toda-Bhim (Jaipur), *Chait Sudi* 10, V.S.1790/1733 AD; *ibid, Pargana* Bairath (Jaipur), *Chait Sudi* 7, V.S. 1786/1728AD., Jaipur Records.

[50] Sawai Jai Singh started some new fairs in Jaipur, e.g. *Tij*, etc.

[51] Cf. Sharma, G.C., *Administrative System of Rajputs*, p.156.

[52] Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century, Op.cit.*, p.80

[53] Sharma, G.C., *Administrative System of Rajputs, Op.cit*, p.155, a responsible man was sent to the places where the fair was going to be held, to organize it; The *Faujdar* of the *Pargana* in whose jurisdiction the fair was going to be held was to go in person to arrange for the safety of traders and their merchandise, and proper police arrangements were made (*Ibid.*). He also made arrangements for fodder or grass and water- *Siyah-Haqiqat* (Jaipur), *Pargana* Toda-Bhim (Jaipur), *Chait Sudi* 10, V.S.1790/1733 AD, R.S.A., Bikaner. A police station or *Kotwali-Chabootra* was also established in the fair where armed persons were kept ready to provide necessary protection to traders and their merchandise. These armed persons called *Nazarbaz*, were paid from the income of the fair, cf. Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century*, p.81.

(III) *Dalals* i.e. Brokers,
(IV) *Kayalis* i.e. Weigh-men, and
(V) *Paledars* i.e. Porters.

The 'whole-sellers' had their shops in the City and its towns and sold their goods to the local retailers. It was through them that the goods were available to the retailers for sale. The local whole-sellers purchased goods from the local producers and manufacturers and some times from the adjoining region. They purchased goods from regional whole sellers and *Kothiwals*[54] too. The retailers of the City and adjoining villages purchased their goods from them[55]. They purchased goods from *Kothiwals* as well as from local manufacturers. Most of the whole-sellers of Jaipur had branches in different towns of Rajasthan. They organized selling in other towns through their *Gumastas* and *Munims*.

'Kothiwals', local and outsiders, who were higher in hierarchy to the whole-sellers, were wealthy traders and controlled the entire whole-sell trade by involving huge investments. They were involved in both internal and external trade. They carried on trade between Rajasthan and different parts of India and had their braches in the various cities of the Country[56]. They were stockiest of local manufactures as well as goods imported from out-side Rajasthan. The whole-sellers purchased goods from them. It was through the *Kothiwals* that the locally manufacturing goods and raw material were sent to other parts of the Country[57]. In Jaipur Records, we have references about some famous exporters of Qandhar who carried on extensive trade of indigo and cloth between Jaipur and Qandhar.[58]

Like the whole-sellers, 'retailers' played a significant role in the proper functioning of the marketing system established in Jaipur. In fact, they were the backbone of local trade. The retailers purchased goods either from the local whole-sellers or from regional whole-sellers. They, in turn, sold the consignment piecemeal, on competitive prices to the consumers. The retailers are comprised of three categories- shop-keepers, pavement dealers known as *pattiwals*, and peddlers called *pheriwals*. Out of these, first two categories were important. References are a lot in the Jaipur Records which show that the shop-keepers of the towns of Jaipur generally carried on their trade sitting in their shops[59]. The other main category of the retailers was of the pavement traders, known as *pattiwals*. They carried on their trade in a stall or a vantage spot easily available to the consumer. Like the shop-keepers, the pavement traders sold various commodities, i.e. cloth, grocery goods, shoes, grain, iron goods etc. In Jaipur Records, there are numerous references to such type of dealers in the towns of Jaipur[60].

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[54] This was the chief merchants and money-lenders' community of Rajasthan.

[55] Cf. Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century*, pp.98-99

[56] Gupta, B.L., *Trade and Commerce in the 18th Century, Op.cit*, p.99.

[57] Ibid, pp.99-100

[58] Messrs Ismail Khan, Ibrahim Khan and Bhure Khan were famous exporters of Qandhar who carried on extensive trade of indigo and cloth between Jaipur and Qandhar, *Parwana* from Maharaja Madho Singh (son of Jai Singh) to Ismail Khan and Ibrahim Khan Pathan of Qandhar dated *Asoj Vadi* 3, V.S.1819/1762 A.D., *Mawazana-Kala*, Jaipur Records.

The peddlers known as *pheriwals*, were petty traders. They carried the pack-load of articles on their back or pony, ox or camel, from one locality to another for sale in piecemeal to the desired consumers after striking a favourable bargain. The peddlers used to sale all kinds of essential goods, like cloth, grocery goods, ghee, edible oils, grain, salt, etc. They also carried their goods for sale in the weekly markets of the City, its towns and the villages[61]. The purchasers who belong to the villages generally paid the price in grain[62].

'*Dalals'* or the brokers played a significant role in striking a bargain between the seller and the purchaser. In fact, they worked as viable link between the seller and the purchaser. Some times they gave surety for payment of the price of the goods to the seller. In lieu of the service so rendered, a fixed commission or *dalali*, the rate of which varied from item to item, was given to them by the seller and in some cases by the seller and purchaser both. In Jaipur, the rate of commission was twelve *dams* for the sale of one camel-load of cloth[63]. The brokers were experienced persons, well-conversant with the demand and supply of goods in the market. They had good knowledge of the financial position of the traders. For fair and smooth trading, the government nominated an influential man as a commission agent. Generally there were separate brokers for popular merchandise[64].

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[59] In *Rojnama Chabootara-Kotwali*, *qaswa* Tonk (Jaipur), V.S.1760/1693AD, there is a reference to Lakha, a grocery merchant of Lakheri, who carried one ox-loaded of grocery from Tonk to Lakheri, for sale.

[60] In the *Rojnama Chabootara-Kotwali* records of Jaipur (*qaswa* Averi, V.S.1753/1696 A.D.), Kishan Pema, Gokul, Durga and Kalu are mentioned as bonafide *pattiwals* or the pavement dealers of *qaswa* Averi.

[61] Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century, Op.cit*, p.101.

[62] Particularly the people belonged to the villages preferred to make the payment for the goods purchased from the *pheriwals* in kind, *ibid.*

[63] *Rojanama Chabootara-Kotwali*, *qaswa* Averi (Jaipur), V.S.1753/1696 A.D., Jaipur Records, R.S.A, Bikaner.

Kayalis or the weigh-men were equally important as links in the marketing. The *kayals* weighed the goods sold in the *mandis* of the City and its towns and were paid a fixed amount called *kayali* or *tulai* in lieu their service[65]. The porters known as *palledars* or *hammals* held the lowest position in the marketing system. Their main function was to load and de-load goods in the mandi. They were paid on the basis of the weight of the consignment[66].

As for as, the 'marketing of agricultural product' was concerned, a sizeable part was sold by peasants in the villages to the *mahajan*[67]. The *mahajan* sent the grains for sale to the *mandi* of the nearby town or the city[68]. Apart from the traders, the *zamindars,* and a section of the peasants also carried their produce laden on a camel or a bullock cart to the known trader of the nearby *mandi*[69] situating in the city or its towns, who contrived to sell the produce at market rates. He paid to the peasant the amount of money accruing from the sale of the product, after deducing his commission for the service so rendered[70]. There were numerous references to the *Bohras* (money lenders), who were assigned right to realize revenue by the ruler or *jagirdars* against the amount of money borrowed by them[71]. *Bohra* sent the produce for sale to the markets existing in the nearby cities such as Jaipur, preferably during the lean season, when the margins of the profit happened to be larger[72].

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[64] Messrs Muizuddin, Dilawar Khan and Mohakamdin were brokers of horses in Jaipur (*Parwana* to Muizuiddin and Mohkam Dalal dated *Ashad Badi* 7, V.S.1837/1780 A.D.), and Shambhu Mundhara was a broker of camels only in Bikaner, *Kagada-ri-Bahi*, No.10, V.S.1854/1797 A.D., Bikaner Records.

[65] *Rojnama Chabootara-Kotwali*, *qaswa* Averi (Jaipur), V.S.1753/1696 A.D., Jaipur Records.

[66] *Byav-ri-Bahi*, No.158, V.S.1827/1770 A.D., Bikaner Records; Gupta, B.L., *Op.cit*, p.102

[67] *Parwana* to Bohra Raj Kiran Daulat Ram, dated *Shravan Sudi* 14, V.S.1835/1768 A.D., *Draft-Kharita* and *Parwana*, Jaipur Records; The peasants, being poor, were generally in debt. In pursuance of the agreement made at the time of borrowing money, they handed over their produce to the *mahajan.*

[68] Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century, Op.cit.*

[69] *Rojnama Chabootara-Kotwali*, *qaswa* Tonk (Jaipur), V.S. 1750/1693 A.D., Jaipur Records.

[70] Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century, Op.cit.*

[71] *Parwana* to Fakir Das Vyas dated *Margashirsha Vadi* 1, V.S.1782/1725 A.D., *Marwazana-Kala*, Jaipur Records.

[72] Cf. Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century*, p.104

Like the peasants, artisans also sold their artisans through a chain of middlemen. Generally, the big artisans sold most of their manufacture either to the retailers or whole-sellers, the retailers, in turn, sold to the ultimate buyers. The whole-sellers sold to the retailers as well as to importers or exporters (*Kothiwals*) from different parts of the country. The small artisans sold their products to the local middlemen i.e. retailers or whole-sellers. However, some small artisans sold their products directly to the consumers at their residence or shops[73]. Artisans also carried their products for sale to the weekly markets or *Hats* and fairs where people came in large numbers[74]. The government made arrangement for the proper functioning of the marketing of different commodities. Necessary measures were taken to check mal-practices in the market[75].

The condition of artisans, particularly of the urban artisans who were employed in *Karkhanas* and the big artisans, was satisfactory and they led a better life in comparison to peasants who were excessively burdened with innumerable taxes (*lag-bags*)[76]. So far as the small artisans are concerned, their condition because of their low financial status (low wages and little demand of their goods due to low purchasing power of the common men), was not good[77].

IV

Jaipur was not only a flourishing market place, it had also many industries and handicrafts[78]. Trade and industries are interlinked, as the progress of one depends on the other. Like his predecessors, Sawai Jai Singh also encouraged various types of industries in his State. The industries in Jaipur may be classified into two categories:

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[73] Ibid.

[74] Ibid, p.105

[75] The measures taken by the State in this field will be dealt in a separate section on 'State-Policy'.

[76] Cf. Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century*, p.247

[77] *Yaddashti-Dastur-Amal, Sair Chabootara-Kotwali, qaswa* Toda Bhim (Jaipur), V.S.1798/1741 AD, Jaipur Records; *Rojnama Chabootara-Kotwali, qaswa* Tonk, V.S.1750/1693AD; The artisans, being in financial strains, were compelled to take money in advantage from the merchants for the purchase of raw material and essential accessories. In turn, the merchants made an agreement with them to sell their products to them alone. The artisans were paid low price, although they felt assured of the returns of their labour. It does not mean that the artisans, who did not take money in advance in the form of cash and raw material or as loan from the middlemen, enjoyed a good sale of their goods. In fact, the whole-seller and the affluent big retailers took full advantage of the low financial condition of the artisans; *Ibid*, p.239.

77 Girdhari's *Bhoijanasar, Op.cit, Doha* or Verse Nos. 199, 200; *Bhuddhivilas, Op.cit,* Stanza No.112, and some foreign travelers' accounts clearly mention about various industries in the Jaipur City.

(I) Cottage Industries,

(II) State owned *Karkhanas* and other industries, such as, textiles, metal work (armaments & utensils), salt industry[79], ornaments (gems & jewellary), stone industry, wood work, leather work, bangle industry, perfumery, ivory work and paper manufacturing.

Cottage industries[80] were mainly situated in the villages and *qaswas* or towns. To cater the needs of the inhabitants of Jaipur, traders brought the products of these industries to the City. Besides, big peasants and ruler merchants also brought their agricultural and other products[81] for sale in the markets and *mandis* of Jaipur.

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[79] Jaipur was one of the main salt producing states of Rajputana (The other two states were Marwar and Bikaner). Sambhar, a joint territory of Jaipur and Marwar states, about 12 kms in length and 3 kms in breadth(Gupta, B.L., *Op.cit,* p.118), was the main salt producing lake (Which was also the main salt producing region of India., *ibid*). Here salt worth several lakhs of rupees was manufactured annually- *Khulasa-ut-Tawarikh,* pp.34, 59. According to Manucci annual income from the salt of this lake in 17th Century was Rs 17, 00,000- Manucci, Eng, Tr., William Irwine, Ed. 1907, Vol. II., p.425. In 1726 A.D., 1, 25000 bullocks were loaded with salt at Sambhar (salt was transported from Sambhar)- *Siyah-Hazoor* (Jaipur), *Asoj Badi* 2, V.S.1783/1726AD, No.958, Jaipur Records, R.S.A.,Bikaner.

[80] There were a number of cottage industries in the villages to meet the local demand. Spinning and weaving were important branches of ordinary village industry in which course cotton and woolen cloths were mainly prepared. Next to agricultural and allied occupations, namely, the conversion of crops into such consumable articles as *ata* (grain-flour), *dal* (millets), oil, *gur* (raw sugar), etc. and the rearing of cattle, sheep, goats, camels and other livestock, cottage provided remunerative employment, either part or whole time, to the people in rural areas of Jaipur. The number of persons supported by these industries and the value of the goods produced by them, show that they play an important part in the economic welfare of the people. Of these, industries connected with the production of clothing employ the largest number of persons as spinners, weavers, dyers, printers, tailors, etc.- *Jaipur- Its History Rulers and Facts Up to the Year 1948*, ed. work, First pub. in 1948 by the Information Bureau, Gov. of Jaipur, Rec. and Pub. by Low Price Pub., Delhi, 2002, p.127 ("Industries" by K. Sanjiva Rao). The important cottage industries in the village were: *Gur* or unrefined sugar was an important cottage industry in the rural sector; it was manufactured from sugar cane. Producing edible oils was another important rural industry. *Teli* or *Gandhi* extracted variety of oils through *ghani* or *kohlu.* Production of liquor was another important rural industry. It was manufactured by the *Kalali.* In the region of Jaipur, one Khema used to make liquor in the village of Baswa (*Dastur-Kaumwar,* Vol. 23, f.49, Jaipur Records). Liquor was made out of date-palm tree (In his autobiography *Babernama,* Baber describes in detail, the method of preparing liquor in the north-eastern Rajasthan (*Babernama,* Eng. Tr. by A.S. Beveridge). The date sale of liquor was not allowed in the market of the village. It could be sold only out side the village- Gupta, B.L., *Op.cit,* p.55. The hand spinning and weaving of cloth there of, was another important rural industry. The people who were engaged in the weaving of cloth were called *Tana Dar.* The cloth produced was generally course and was mostly used by the rural folk, *Ibid.*

[81] Agriculture and Allied Occupations: The potter, carpenter, shoemakers or cobbler, blacksmith, and weavers were found in almost every village. The potter prepared earthen pots, the carpenters wooden goods (Wooden utensils and agricultural implements), and the cobbler (*chamar*) manufactured shoes and *charai* (leather buckets used for drawing water from the wells). The blacksmiths manufactured iron implements, pots and other oil from oilseeds were the common village industries-Sharma, G.C.,

On the name of State owned industries, *Karkhanas* could be put in this category. These *Karkhanas* were the State's manufacturing departments, which manufactured the quality articles required by the State and the royal household[82] and were well organized. The list of these *Karkhanas*[83] runs as: (1) *Kapad-dwara*, which included- (a) *Kirkirakhana* (Woolen clothes section), (b) *Jargarkhana* (Embroidery), (c) *Toshakhana* (Wardrobe) and (d) *Khazana Behla* (Private treasury), (2) *Pothikhana* (Library and Manuscripts department), (3) *Suratkhana* (Paintings), (4) *Kheyalkhana* (Puppetry), (5) *Silekhana* (Arms and Weapons), (6) *Farrashkhana* (Tentage and furnishing department), (7) *Palkikhana* (Palanquins), (8) *Pheelkhana* (Elephant stable), (9) *Buggikhana* (Carriages), (10) *Shutarkhana* (Camel Stables), (11) *Rathkhana* (Chariots), (12) *Tabela* (Horse Stables), (13) *Gwalera* or *Goukhana* (Dairy), (14) *Shikarkhana* (Hunting), (15) *Rasowara* (Kitchen), (16) *Modikhana* (Stores), (17) *Taterkhana* (Hot Water department), (18) *Tambukhana* (Betel), (19) *Aukhandkhana*, (20) *Imaratkhana* (Building department), (21) *Mistrikhana* (Carpentry), (22) *Nakkarkhana* or *Naubatkhana* (Drums), (23) *Gunijankhana* (Department of musical performers), (24) *Karkhana Puniya* (Charity department), (25) *Bagayat* (Gardens department), (26) *Khabar* (Filigree and Intelligence), (27) *Tarakhana* (*Gota-Kinari*) (Lace work), (28) *Khusbukhana* (Perfumery), (29) *Nakhas* (Horse market), (30) *Mashalkhana* (Torch house), (31) *Patangkhana* (Kite department), (32) *Patarkhana*, (33) *Rangkhana* (Dyeing department), (34) *Raushan-Chauki* (Moving orchestra). The department of *Karkhana-Jat* supervised and co-ordinated the activities of various *Karkhanas*, considered either as separate units or grouped together.

The productions of such *Karkhanas* were not meant for sale and were for the exclusive use of the State and met the requirement of the ruler and his household. The articles were wardrobe, carpets, tents, saddlery, harness, horse shoes, arms and ammunitions, standards, *houdas* elephants covers, etc.[84] As the names suggest, some of the *Karkhanas*, such as *Tambukhana, Rasowara* and *Tatarkhana,* catered to the day-to-

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Op.cit, p.168. The artisans associated to these industries rendered essential service to farmers on *Jujmani* basis- Gupta, B.L., *Op.cit*, p.54. The artisans adopted professions hereditarily and were grouped in castes, *Rojnama-Chabootra-Kotwali*, *qaswa* Tonk, V.S.1750/1693AD, Jaipur Records.

[82] *Khatoot-Ahalkaran* (Jaipur), Bundle No.2, Register No. 222, V.S.1752/1795A.D., Jaipur Records.

[83] G.N. Bahura has compiled a list of 34 *Karkhanas* from the Rajasthan State Archives at Bikaner, from *Kapad-Dwara* at Jaipur and other sources. This system was continued until the inception of the present Rajasthan State.

[84] Sharma, G.C., *Administrative System of the Rajputs*, *Op.cit*, p.169

requirements of the Maharaja and other inmates of the palace[85]. *Karkhanas* like the *Nakkarkhana* and the *Mashalkhana* were called in to contribute to the paraphernalia of state processions. In these *Karkhanas* expert artisans, local and outsiders were employed to manufacture the above quality goods[86]. *Arhsatta-Karkhanajat* mentions that Fateh and Dost Muhammad were famous calico printers (*Chhapakhana*) of Jaipur[87].

Kirkirakhana and *Atishkhana*: Jaipur was famous for iron industries i.e. Armaments and Utensils. Horse shoes, bridles, utensils big and small, needles, scissors, knives, iron chains and all kinds of agricultural implements were manufactured there[88]. Among armaments, swords of various types, daggers, bows and arrows, lances, spears, *Khanda, Kunti, Narajus*, axes, shields, pieces of cannon, big guns and matchlocks were manufactured in Jaipur[89]. In Jaipur Records[90] mention has been made of an export craftsman, named, Imam Kamal, who was employed in the Royal *Karkhana* for the manufacture of cannons. The cannons and guns were cost at the 'Jaigarh Gun-Foundry'[91], the remains of which can still be seen today. Here, the famous *Jaivana*[92], contemporary Asia's biggest gun on wheal, was casted during the period of Sawai Jai Singh[93]. Cannon balls were also manufactured here[94]. For casting cannons, metals like brace, copper, iron and zinc were used[95]. Gun powder was also manufactured in the City's *Karkhanas* (*Atishkhana*) especially built for this purpose. The craftsmen who manufactured guns and canons were known as *Shorgirs*[96].

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[85] These *Karkhanas* were for the supply of the daily victuals like- food, pan, etc, or for the supply of medicinal perfumes etc., cf. Roy, A.K., *History of the Jaipur City*, p.58

[86] Cf. Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century*, p.56

[87] *Arhsatta-Karkhanajat* (*Chhapakhana*), Baisakh Sudi 3, V.S.1794/1737 A.D., Jaipur Records.

[88] *Kirkira-Khana* (Jaipur), *Chait Sudi* 17, V.S.1795/1738AD, Jaipur Records.

[89] Cf. Sharma, G.C., *Administrative System of the Rajpurts*, pp.170-175

[90] *Dastur-Kaumbar*, Vol.23, f.45. Jaipur Records, R.S.A., Bikaner.

[91] See Plate No. 29 (A)

[92] See Plate No. 29 (B)

[93] Khangrot, G.S., *Jaigarh: The Invinsible Fort of Rajasthan, Op.cit.*

[94] Cf. Gupta, *Trade and Commerce of Rajasthan during the 18th Century*, p.59

[95] Method of casting cannons - The metals were first smelted with the help of chemicals, named *Sonamukk* and *Suhaga* and then cast in the mould. Later the cast was immersed into a well, to let the smelted metal cool down- Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century, Op.cit*, p.58. Raja Man Singh borrowed the techniques of casting cannons from Qandhar, during the Mughal Campaigns there in the Akbar's period.

[96] *Agnitantra-Grah* or *Silehkhana* (Jaipur), V.S.1796/1739 AD; *Siyah-Hazur* (Jaipur), *Magh Sudi* 2, V.S.1783/1726 AD; cf. G.S. Sharma, *Sources on Social and Economic History of Rajasthan*, p.179

The main reason for the growth of this perfumery industry was the great liking for oils and scents by the wealthy classes. Jaipur Records show that different kinds of perfumes like rose, sandal, *khas, sukhvil, sakhwas, makhluti* and *Gulkheri* were prepared in the royal *Karkhanas* as *Khushbukhana*[97]. Rose-water from flowers of rose, and oil from jasmine flowers was prepared[98].

The main objective behind establishing these *Karkhanas* was to provide State patronage to scholars, poets, writers, painters, musicians, dancers and craftsmen of various description, train them in their respective vocations and ensure a consistent output of utility items, arts & crafts from them. The artisans received patronage of the aristocracy in profusion. It was because of State's efforts that a large number of skilled craftsmen from all over the country came and settled down in the Capital City of Jaipur. This led to a splendid build-up of handicraft manufacturing here[99].

The urban industries of Jaipur other than the *Karkhanas* comprised textiles, dying and calico-printing, armaments, utensils, ornaments (gems & jewellery), wood-work, bangles, ivory, leather goods, perfumery, and stone cutting (marble carving). Though, unlike the rural industries, the urban industries of Jaipur were better organized, these industries were in the nature of handicrafts and there were no factories in the modern sense. The industries were run by skilled artisans and craftsmen, assisted by the members of the family and apprentices who received training under them. Frequently merchants, too, engaged craftsmen either on daily wages or by supplying them with raw material for the manufacture of industrial goods. The main industries, other than the *Karkhanas,* which flourished in Jaipur during the period under consideration, were as follows:

Textiles: The Jaipur textiles industry may broadly be categorized in two groups: (a) Cotton-cloth industry and (b) Woolen-cloth industry. Since Jaipur was a cotton growing area, cotton cloth industries developed here and it became known for the highly developed cotton cloth industries in the medieval period[100]. Turbans, *saries* dyed and printed or embroidered and silk knitted with silver thread for wearing on the turbans, were the products for local consumption cotton cloth was manufactured here on a large scale[101] and Sanganer, a town close to Jaipur, became famous for the manufacture of cotton *saries* and calico printed scarves[102] and *Chintzes*, which were dyed and printed at Sanganer, not only fulfilled the needs of Jaipur State but were also exported to the other states of Rajasthan[103]. The tie work known as *Chunri* and *Jaharia*[104], for which Sanganer was renowned and was in a great demand through out the Northern India[105].

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[97] *Arhsatta-Karkhanajat* (*Khushbukhana*), *Bhadrapad Sudi* 3, V.S.1776/ 1719 AD.

[98] *Arhsatta-Karkhanajat* of 1720 AD shows that sandal wood @ Re 1 *seer* & *abir* @ Re 1 for 2 ½ *seers*, worth Rs 300 & *anna* 9, was purchased for the manufacture of scent and oil of sandal. The price of some of the scents & oils are given here – (i) Sandal oil: 5 *seers* @ Rs 2 per *seer*, total cost- Rs 10, (ii) Rose sent: *tola* & 9 *masha* @ Rs 11 per *tola*, total cost-30, (iii) *Kasturi* oil: 6 *tola* & 5 *masha* @ Rs 2 & *annas* 12 per *tola*, total cost-Rs 17 & 2 *paisas,* (iv) Rose scent: 1 *tola* @ Rs 5 per *tola*, total cost- Rs 5, *Arhsatta-Karkhanajat* (*Khushbukhana*), *ibid*, *Baisakh Sudi* 3, V.S.1777/1720AD.

[99] Gupta, B.L., *Trade and Commerce in Rajasthan during the 18th Century,op.cit.,* p.56

A superior type of velvet and *phanta* cloth was also manufactured at Jaipur. Jaipur records[106] mention about Thaman Das and other skilled craftsmen of Gujarat who permanently settled in Jaipur. They used to manufacture fine quality of velvet and *phanta*. Sanganer and *Bagru Chintz* were among the renowned Jaipur textiles[107]. Sheep breeding was an important occupation of the people of Rajputana. It helped in the establishment of the woolen industries at different places. In Jaipur, Malpura was an important centre of woolen cloth industry. Woolen was used for the manufacture of carpets, *ruge*, shawls and blankets (*Lohis*), *jugis*, caps, saddle cloth, etc[108].

Iron Industry: Besides weapons, iron utensils for domestic use were manufactured in the City. The articles manufactured in this category were *Tateri* (Jar), *Kudchha* (Ladle), *Lotah,* Cauldron, *Handiya, Karai, lorada, kuncha, kurachi, taita, sandasi, tatedo, hamam-dasta, dol, tawa,* needles, iron wires etc. These articles were manufactured by the local craftsmen (blacksmiths)[109]. Utensils of brass, copper and bronze were also made in every town and big villages by the local craftsmen known as *kaseras* and *thetheras*. Jaipur was one of the main centres of this industry. *Thali, that, thal, Dukadiya, katori, Parat*, etc. were the items put in this category. The craftsmen acquired great skill in the making of utensils of silver and gold to be used by the aristocratic class[110].

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[100] Cf. Sharma, G.C., *Administrative System of Rajputs*, p.169; B.L. Gupta, ibid, p.56

[101] Sharma, G.C, ibid.

[102] Gupta, B.L., *Trade and Commerce of Rajasthan during the 18th Century, op.cit.*

[103] *Chhapa-Khana* (Jaipur), *Mangsir Badi* 7, V.S.1783/1726 A.D.

[104] Cf. Sharma, G.C., *Administrative System of Rajputs,* p.170

[105] Gupta, B.L., *Trade and Commerce of Rajasthan during the 18th Century,* op.cit., p.57; Fine turbans in Check as well as in wavy lining for men and dupatta or scarves for women were dyed with dexterity by a Muslim community known as *Chadive* which was immigrated from Multan to Rajasthan (Nagor) during the 15th Century. In Kota region, this tie and dye work was known as *Chunri Bandish, ibid.*

[106] *Dastur-Kaumbar* (Jaipur), Vol.23, f.345, Jaipur Records, R.S.A., Bikaner.

[107] *Imperial Gazetteer of India, Op.cit,* Provincial Series of Rajputana, p.244.

[108] The woolen goods were used by the rich and the common folk. But to meet the fastidious demands of the aristocracy, most of the woolen shawls, especially *pashmina*, were imported from Punjab and Kashmir. Also cotton cloth of fine quality, viz, muslin, linen and silk was imported from Dhaka, Banaras and Chanderi; cf. Gupta, B.L., *Trade and Commerce of Rajasthan during the 18th Century,* p.58

[109] Ibid, pp.59-60

Ornaments (gems & jewellery): Abul Fazl speaks very highly of the goldsmiths and jewelers of Rajasthan, for their excellent workmanship[111]. The history of the industry of 'gems & jewellery' in the Jaipur City is older than the City itself. Before Jaipur, Amber was the centre of trade in gems & jewellery. A great variety of ornaments, plain and jeweled were manufactured in Jaipur which was famous throughout India for its excellent jewellery and enamel work. It appears from the Jaipur Records that the Maharajas here were very fond of jewellery. To encourage industry, a number of jewelers and skilled craftsmen were called from Delhi, Lahore and elsewhere. They were provided with free land to construct houses and were exempted from taxes[112]. The craftsmanship in this field was dominated by the Muslims but its trade was in the hands of the Hindu community. *Jauhari-Bazar*, the jewellery market of Jaipur, acclaimed its reputation in the World for gems & jewellery, and this market still maintained its position.

Stone Industry: Since stone hills existed around Jaipur, the stone was in abundance and easily available. Jaipur was one of the main centres of Rajasthan for the mining of different varieties of stone and allied industries. Though, Makrana was famous all over the country for its marble quarries- particularly white marble of exquisite quality[113] which was also used in the Taj-Mahal, the mines at Raila in Jaipur were popular for grey-marble. Abundant lime-stone of superior quality was available in Rahari near Jaipur[114]. The availability of such varieties of stone led to the growth of subsidiary industries like stone-carving, sculpture, engraving and brick & lime manufacture. The royal palaces, mausoleums, temples and the *havelis* (Mansions) of nobles and wealthy merchants manifest the high architectural craftsmanship. The sculptures of Jaipur were well known all over India for their dexterity in the carving of statues[115].

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[110] Ibid, p.60

[111] Abul Fazl, *Ain-i-Akbari*, Eng.tr. by Blochmann, Vol.II, pp.192, 273.

[112] *Dastur-Kaumbar* (Jaipur), Vol.31, ff.401-403; Gupta, B.L., *Op.cit*, pp.62-63.

[113] Cf. *Imperial Gazetteer* of India, p.53

[114] Ibid, p.54

Paper Manufacturing: Papers both white and coloured were also manufactured at Sanganer and Jaipur. The white paper was sold at the rate of Rs. 3 & *anna* 10 and 6 pies per *gaddi* or bundle, while the cost of the costly coloured paper was at the rate of one *anna* per sheet[116]. Now the quality of paper can be estimated by its price during that period when the purchasing power of one *anna* was more than a rupee now.

Woods and Leather Industries: The wood work in Jaipur also formed an important industry here. A particular caste called *Khati* was chiefly engaged in this industry. From the contemporary records, we know that different kinds of wooden articles like wooden toys, furniture of daily use, door-frames, windows, agricultural implements, carts, boats, chariots and palanquins were extensively manufactured. In the Jaipur Records, there are several references to the carpenters who had attained great skill and efficiency in the making of the articles. Pema, Harya and Bihar have referred to in *Dastur-Kaumbars* as famous carpenters of Jaipur[117]. They were specialized in the manufacturing of chariots and palanquins. In *Dastur-Kaumbar,* Vol.4, Bhima and Hema are mentioned as skilled carpenters. They were handsomely rewarded by the Jaipur-Darbar for manufacturing a beautiful elephants-seat and boats. Fakira has been mentioned in the *Khatoot-i-Ahalkaran*[118], as a skilled carpenter of Jaipur who was posted at Jahanabad (Delhi) for making musical instruments on daily wages at the rate of 8 *annas* per day. Wooden articles like windows, door-frames and doors to be used in the houses of the common men and the stately buildings of nobles and the palaces of the King were manufactured by the local artisans skillfully[119].

The leather industry was well developed. The artisans, who were engaged in this industry, were called *Chamar* and *Mochi.* In the Jaipur Records, there are references to numerous leather articles which were prepared by the local craftsmen such as shoes, scabbards of the swords, saddles shields and bridles, covers of books, leather buckets and oil-jars[120]. In a *Dastur-Kaumbar*[121] mention had been made of a shoe-maker, named, Dola, who was skilled in the making of beautiful saddles in Jaipur. There was a separate market known as *Katla* in the big towns for the manufacture and sale of the leather goods.

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[115] *Dastur-Kaumbar* (Jaipur), Vol.23, ff.42, 597, 598, Jaipur Records, R.S.A., Bikaner.

[116] *Rojnama* (Jaipur), *Pargana* Gijgarh, *Baisakh Sudi* 11, V.S.1769/1712 AD; *ibid, Pargana* Kuwava (Jaipur), *Baisakh Sudi* 11, V.S.1769/1712 AD.

[117] *Dastur-Kaumwar* (Jaipur), Vol.23, f.483. Jaipur Records, R.S.A., Bikaner.

[118] *Chitthi* or Letter from 'Radha Vallabh to Thakur Hari Singh' dated *Asoj Sudi* 1, V.S.1750/1693 AD; *Khatoot-Ahalkaran* (Raj.) No.116, Jaipur Records.

[119] Cf. Gupta, B.L., *Trade and Commerce of Rajasthan during the 18th Century*, p.64

Bangle and Ivory Industry: The ladies of all the sections of society were very fond of wearing bangles, taxed as *Chura.* The craftsmen, engaged in this industry, were known as *Lakheras* and *Charigars*. The *Charigars* had to pay a tax, named *Chothai.* Sometimes the *Charigars* were exempted from the payment of this tax. A large variety of articles such as bangles, bracelets, handles of swords, toys, beds *teads*, etc, were manufactured throughout the Jaipur region (particularly in Amber)[122]. In a *Dastur-Kaumbar* (Jaipur) mention has been made to an elephant-seat and a chariot of ivory manufactured in Jaipur by Bhima and Bihari[123]. Bangles and bracelets of ivory were manufactured at several places to meet the demand of the common people. Ivory was largely imported from Africa via Sindh and Gujarat[124].

V

Taxation: In order to fulfill their State's economic needs and requirements according to the prevailing conditions, the *Kachhwaha* rulers of Amber (Jaipur) adopted a system of taxation based on Mughal pattern but with some modifications. In addition to land and its produce forests, mines, excise and customs were the important sources of revenues available to the State. The main sources of the income of the government were the numerous taxes realized from peasants, artisans and traders. The taxes may be categorized into two broad divisions: (I) Commercial Taxes and (II) Non-commercial Taxes.

The commercial taxes (the taxes levied on articles of trade) includes transit duty/ sales tax and import and export fees and professional taxes, these comprised of *Rahdari, Mapa, Amad* and *Nikasu, Valvati, Baithak, Singoti, Bhachh, Bichhaiti, Inchh,*

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[120] Some times government exempted them from paying taxes on the sale of these articles; cf. Gupta, B.L., *Trade and Commerce of Rajasthan*, p.64.

[121] Dastur-Kaumwar (Jaipur), Vol.23, *Op.cit*, f.414.

[122] *Kirkira-Khana* (Jaipur), *Chait Sudi* 12, V.S.1795; cf. Tod's *Annals*, Vol.II, p.25

[123] *Dastut-Kaumwar* (Jaipur), Vol.4, ff.319, 323, Jaipur Records, R.S.A., Bikaner.

[124] Cf. Tod's Annals, Vol.II, p.226; Gupta, B.L., *Trade and Commerce of Rajasthan during the 18th Century, Op.cit*, p.68

Parkhai, Ferry Tax, *Tulai* or *Kayali, Tola-Chhapai, Dukana-ri-Chowkidari, Nap-Chhapai, Jagirdar-ri-Kori,* etc. The non-commercial taxes comprised of *Hasil* (land-revenue), House Tax (*Ghari-ki-Bichhoti*), Marriage Tax, Fee for issuing *Pattas*, Tax on forest produce, Grass Tax, Establishment Taxes, etc.

Rahdari (Transit Duty) - This duty was charged on the goods which only passed through the State. It was a fee for the protection which the State provided to the traders. It was known as *Rahdari*[125]. The rates of transit duty on different articles were usually charged per camel load which was equal to 20 mounds[126]. *Chithi-qarar Hasil-Dastur-Rahdari* of the year V.S.1767/1710 A.D. provides us the rates for transit duty in the State for different items and means of transport[127]. This list shows that the articles of daily use such as food grains, sugar and salt were taxed lightly. *Mapa* - It was charged on the goods which were sold in the markets. Its rates were one seer per mound of grain. Hence it was also known as *Serino*[128]. *Amad* – The goods which were imported for sale in the market were taxed at the boundary of State. It was a sort of import tax of modern days[129]. *Nikasu*– It was a tax on goods passing out of a town or on goods brought from one place to another and taken away again not having been sold. The rate of export duty on *Reja* Cloth was a *dhela* per rupee[130].

Baisak or *Baisuk* – Weavers, blacksmiths, spinners and other venders who brought their goods for sale in Hats (weekly markets), had to pay some nominal tax. It was also known as *Bichhaiti* and its rate was one dam per rupee[131]. In Sanganer the rates for occupying space in the weekly market for cloth seller were 25 dams while cloth printers, gold smiths, potters, cobblers, leather tanners, *Rangrejs* and tobacco sellers paid 12 ½ dams[132]. *Chapa* – The rates of tax for printing cloth varied according to the kind of cloth used. Dastur Amal of Sanganer shows that 15 ½ dams were charged on a piece of Iktara, Malmal, Tansukh and Khaso varieties of fine cloth and 25 dams were charged on a piece of Ghagro Mehar, Ghadra Chosudi and Ghagra Ratulko[133]. *Inchh* – It was charged on vegetables, fruits, flowers and other edibles which were brought for sale in the markets[134].

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[125] *Rojnama Potedar* (Jaipur), *Pargana* Pida, V.S.1771/171AD, Jaipur Records. R.S.A., Bikaner.

[126] Though horse, ox, head and cart loads were also considered at different rates for different articles.

[127] This rate list is also shown by G.C. Sharma, *Administrative System of the Rajputs, Op.cit,* pp.130-131

[128] *Rojnama Pargana* Dausa, Tappa-Pholesar (Jaipur), V.S.1729/1672AD, R.S.A., Bikaner.

[129] Sharma, G.C., *Administrative System of the Rajputs, Op.cit,* p.165.

[130] *Arhsatta, Pargana* Amber, Tappa-Haveli, No.930, V.S.1783/1726AD, R.S.A.B.

[131] Ibid.

[132] *Dastur Amal*, Sanganer (Jaipur), No.49, 50; cf. G.C. Sharma, *Administrative System of the Rajputs,* p.132

Parkhai – It was a coin testing fee, paid as a remuneration of the person who was appointed to test the coins[135]. *Tulai* – This tax was levied on goods which were weighed in the market for sale. It was a fee or perquisite paid to the weigh man at the rate of one paisa per rupee (1%)[136]. It was also known as *Kayali*[137]. *Tola-Chhapai* – It was a fee for stamping weights. It was charged from every shop after every sixth or seventh year. *Dukana-ri-Chowkidari* – It was a tax to meet expenditure when *Chowkidars* were appointed to keep watch at night on shops in a market[138]. *Nap-Chhapai* – It was a fee for validating or recognizing the yard or measuring rod of cloth merchants[139]. *Jagirdar-ri-Kori* – Some jagirdars were authorized by the State to realize this tax from the goods passing through their territories. It was a protection fee. *Bail-Brar* (Oxen *Brar*) – The traders who spent their rainy season in the State had to pay this tax as a grazing fee. *Nav-ka-Ghatta* (Ferry Tax) – This tax was levied on the goods which were taken across the river[140].

Taxes on different Professions – Persons employed in various professions, or those wishing to start a new profession, had to pay some amount to the State which can be termed as profession tax or a license fee[141]. The tax charged from tanners and dyers of leader was known as *Kholdi* or *Adholi* and its rate was nine *takkas* per family[142]. According to *Dastur-Amal* of Sanganer one *takka* was charged from a broker on the sale of 20 *Thans* of cloth and 12 ½ dams were charged on the sale of Dhoti[143]. Every profession was taxed in one or other way but the amount of these taxes was so light that it was not considered a burden[144]. *Ghara-ki-Bichoti*–It was the House Tax[145].

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[133] *Dastur-Amal*, Sanganer, *ibid*, No.49

[134] *Arhsatta*, Amber, Nos.897, 898, V.S.1783/1726AD, R.S.A., Bikaner.

[135] *Siyah Haqiqat* (Jaipur), *Pargana* Ghazi Ka Thana, *Posh Sudi* 13, V.S.1788/1731AD.

[136] *Khatoot-Ahalkaran* (Jaipur), Bundle No.1, V.S.1691/161634AD, R.S.A., Bikaner.

[137] Cf. Sharma, G.C., *Administrative System of Rajpurts*. p.165

[138] *Ibid*, p.166

[139] *Ibid.*

[140] *Rojnama Pargana* Kuwva (Jaipur), *Phalgun Badi* 1, V.S.1769/1712AD, Jaipur Recors.

[141] Cf. G.C. Sharma, *Administrative System of Rajpurts*, pp.120-121.

[142] *Arhsatta*, Pargana Amber, V.S.1783/1726AD, No. 926, Jaipur Records.

[143] *Dastur-Amal*, Sanganer (Jaipur), No.21, Jaipur Records.

Non Commercial Taxes: Non-commercial taxes consist of marriage tax, festival tax, house tax, gambling tax, *talabana*, establishment taxes, etc. Every kind of marriage, whether legal or illegal, was taxed. Generally the bridegroom's father had to pay Rs.¼[146]. Any man who wanted to keep a woman other than his wife, a widow or one who had either separated from her husband or had been deserted had to pay a tax to legalize his marriage. This tax was known as *Cheli-Rasi* (*Nata* or RelationTax)[147]. A fine was imposed on irregular marriage. If one had to legalize his irregular marriage, he had to pay a tax. it had to pay a tax to legalize his marriage. This tax was known as *Gharijino*[148]. It was a fee for legalizing illegal marriage[149]. *Betrothal* – A betrothal fee was charged at the rate of two *takkas* from *Khatik, Regar*, Potter, *Koli, Teli*, Cotton-dresser, *Rathda, Nyariya, Neelgar, Panigar*, grain-grocer, and bangle-makers, The Banyas, Cloth printers, gardeners, *Mewatis*, Carpenters, betel leaf sellers, goldsmiths, utensil makers, tailors and dealers in wine paid 2 *takkas* & 4 *Kasa* to the State[150]. Tax on Prostitution – Prostitutes had to pay one fourth of their annual income to the State. The same amount was returned to them when they entertained the ruler on important occasions[151].

Festival Taxes– Taxes were levied on the people to meet the expenses of celebrating different festivals such as *Holi, Diwali, Dashera*, etc. The economic condition of other communities was taken into consideration while charging these taxes. In Jaipur 1 *takka* & 25 dams were charged for *Diwali* and 25 dams for *Holi*[152]. *Jajam* – This tax was realized for royal carpet and was a nominal tax. *Malba* – It was a general name for taxes levied for the repairing tanks and wells, presents to dancers, singers, and the like. etc, who entertained the inhabitants, charitable gifts, expenses on religious worship, occasional ceremonies and festivals arranged by the *Patwaris,* oil for light for the place where the village assembly were held and expenses on *Panchayats* called for the village affairs, feeding and paying to the revenue officials[153]. Gambling Tax – In Jaipur gambling was an offence punishable with fine[154].

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[144] Cf. Sharma, G.C., *Administrative System of the Rajputs,* p.121.

[145] Tod's *Annals*, *Op.cit*, Vol I, p.118; it was also known as *Dhwan* Tax in the region of Bikaner.

[146] Ibid.

[147] *Siyah-Haqiqat*, *Pargana* Ghazi-Ka-Thana, V.S.1788/1731AD, Jaipur Records.

[148] *Rojnama*, *Pargana* Peragpur (Jaipur), V.S.1722/1665AD, Jaipur Records.

[149] Sharma, G.C., *Op.cit*, *Administrative System of the Rajputs, Op.cit,* p.122.

[150] *Dastur-Amal*, Sanganer (Jaipur), No.22. Jaipur Records.

[151] *Banki Das-ri-Khayat*, *Op.cit*, p.12

[152] *Dastur-Amal*, Sanganer, No. 23, Jaipur Records.

Establishment Taxes[155] – Each man who paid a tax was given a sealed receipt. The expenses of the paper and seal were taken from him in addition to the tax. *Kagad-Mohar-Chhap* was to meet the expenses of paper and the seal and also the pay of the person who wrote the receipt and stamped it[156]. *Lawazana* – It was an office tax[157]. *Chauthan* – It was just like a registration fee for the sale of land, houses, shops, slaves, boys and girls and the like. It was charged at the rate of 25% of the total value of the property sold[158]. Besides these, some other taxes such as *Visondh-Dagili, Khakhla-Kadai, Saithani, Niran, Sandari* and *Parno* were also levied but the significance of these taxes is not clear[159].

From the above analysis, it is clear that the rate of taxes, such as, *Inchh, Baisak, Parkhai, Tulai* or *Kayali, Jagirdar-ri-Kori, Tola, Chhapa, Nap-Chhapai*, and Ferry, were nominal. Besides a portion of the receipts of some taxes, it was appropriated to distribute charity to Brahmans and to maintain temples and other religious places[160]. It satisfied the religious sentiments of the people and they did not grudge payment. Liberal exemptions from different taxes were granted to traders. So, it is quite evident that the number of taxes did not hamper the movement of goods and the trade continued to flourish[161].

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[153] Welson's *Glossary*, p. 324;cf. Sharma, *Administrative System of the Rajputs*, p.125

[154] Sharma, G.C., *Administrative System of the Rajputs, Op.cit.*

[155] *Chodhary Bab/Dastur/Brar* - The *Chaudhary* who was appointed in a village received his remuneration from the cultivators in the form of this cess- *Chithi-qrar* (Jaipur), V.S.1788/1731 AD. *Patwari-Brar* – The cultivators had to pay this cess for the remuneration of the *Patwari* who assessed and collected the land revenue- *Arhsatta*, Amber, V.S.1783/1726AD. *Qanungo-Dastur* – A tax which provided the remuneration for the *Qanungo*. It was charged in kind from each village at the rate of one seer per mound- *Chithi-qarar* (Jaipur), V.S.1768/1711AD; *Rojnama, Pargana* Dosa (Jaipur), No.245, V.S.1732/1675AD. *Ugai-Kharda/Talbana* – When the tax payee or cultivators did not pay their taxes or dues within the fixed time, the State sent its men to realize the dues. The expenses of such persons were realized in addition to the original amount of tax. This extra amount was known by different names in different regions- *Rojnama, Pargana* Piragpur (Jaipur), *Kotwali-Chabootara*, V.S.1722/1665AD. *Sarina* – It was paid at the rate of a seer per mound by a hereditary cultivator in a village to his *Jagirdar* as an acknowledgement of the proprietary right- *Chithi-qrar* (Jaipur), V.S.1767/1710 AD. *Tisala-Brar* – It was the tax realized every third year- Sharma, *Op.cit*, p.127. *Hala-ri-Bach* – It was also known as *Hal Brar, Hal Bab* or *Judo* and levied from peasants at the rate of Rs 2 per plough- Tod's *Annals*, Vol.I, *Op.cit*, p.160. *Ghugri-Shahna-Ki* – In every village *Shahnas* were appointed to keep a watch over the crops. They got their remuneration in the form of this tax at the time of collection of land revenue, *Siyah-Haqiqat* (Jaipur), *Pargana Phagi*, V.S.1788/1731AD. Jaipur Records.

[156] *Arhsatta*, Amber (Jaipur), V.S.1783/1726AD, R.S.A., Bikaner.

[157] *Jama-Kharch-Potedar* (Jaipur), *Pargana* Harsana, VS.1722/1665, Jaipur Records.

[158] *Siyah-Haqiqt* (Jaipur), *Pargana* Hindaun, V.S.1788/1731AD, Jaipur Records.

[159] *Arhsatta*, Amber (Jaipur), V.S.1783/1726AD, No. 897; *Chithi-qarar* (Jaipur), VS.1787/1730 AD.

[160] *Chitti Qrar* (Jaipur), *Baisakh Sudi* 13, V.S.1767/1710AD, R.S.A.,Bikanet.; *Dafter-Sanad-Navis*, V.S.1820/1765AD, Jaipur Records.

VI

Within the few years of its foundation, the City of Jaipur emerged rapidly on the commercial horizon in the critical scenes of first half of 18th Century[162]. Though, its geographical and strategic location contributed a lot in its rise, but its main credit seems to go to the state policy i.e. Jai Singh's initiatives in the economic field[163], especially his policy towards various socio-economic groups which was the main generative factor behind it. Such activities on the one hand generated the economic interaction (rural-urban linkage) between a city and its hinterland, and on the other hand, between a city and the outer commercial centers- both within and out side the State (urban-urban linkage)[164].

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[161] Cf. Sharma, G.C., *Administrative System of the Rajputs,* p.166; These were the general taxes which were also prevailed in other Rajput States. There were some 'peculiars taxes' in Jaipur State, viz., *Juda*, Tax on Prostitution, *Rajin-Tapdars*, *Kirori, Bhent-Diwan, Hisabna, ibid*, p. 142.

[162] After the death of Aurengzeb the Mughal Empire disintegrated rapidly and his successors were too weak to check its rapid decline. The result was that many Mughal provincial governors (Such as Nizamul Mulk of Hyderabad, Murshid Quli Khan of Bengal and Asaf Jahan of Awadh) declared themselves independent and most of the Rajput princes of Rajasthan, while owing allegiance to the Mughals, asserted their independence. Sawai Jai Singh too, even when remaining a Mughal mansabdar, became practically independent. Like the other Rajput rulers, now Jai Singh paid his attention more towards the progress of his Watan Jagir (ancestral patrimony) rather than serving the Mughal government with the former zeal and devotion. In the wake of the growing economic crisis, resulting from the gradual fall of the Mughal Empire, the growing expenditure of his expanding State, local administration and the proper maintenance of the army and the royal household, Sawai Jai Singh felt the immediate need of searching for new avenues to augment his income. This led him to show a keen interest in the development of trade and industry in his own State. Every possible effort was made to provide facilities and privileges to the traders and artisans in his State. Unlike the Mughal rulers and princes[162], personally he neither monopolized nor engaged himself in trade- B.L. Gupta, *Op.cit*, p.232. His policy was 'free-trade policy' i.e., open to all, cf. Sharma, G.C., *Administrative System of the Rajputs*, p.149.

[163] The Mughal rulers monopolized certain trades such as gun-powder, lead, salt-peter, etc. and gave monopoly to certain persons to trade in certain commodities like indigo. The princes, princesses and queens too engaged themselves in trade and earned immense profit. The Emperor fixed the prices of market sales and monopolized the banking business and thus earned a lot by issuing to carry on banking business in the Country. No horse could be sold without the knowledge of ruler or his agents. The Emperor could permit or check from doing particular business by issuing a *farman*. No outsider could settle down in the empire to do any business without the prior permission of the Emperor-Moreland, *From Akbar to Aurengzeb*, p.221. Tavernier in his memoirs mentions, "The King [Mughal Emperor] receives royalty from the merchants for permission to mine." - Tavernier's Travels, II, Eng. Tr., p.59. Another aspect of their trade-policy was to encourage trade by giving various facilities and privileges to European and Indian traders, remission in taxes, granting loans from royal mints, building *sarais* to give shelter and protection along the highways, providing safety and security on the trade routes and instructing the officials of different administrative divisions not to harass the traders, Satish Chandra, "Commercial Activities of Mughal Emperors in the 17th Century", presented in the1959's cession of Indian History Congress..

To convert the City of Jaipur into a commercial hub, Jai Singh had taken following rare initiatives which prove the determination of Jai Singh to make the City a commercial centre:

(I) The construction of a large number of shops and markets on the main roads and streets of the City in a well planned way which still functioning.

(II) Besides patronizing the local traders, merchants and craftsmen of the Rajputana, the ruler invited these commercial groups from other parts of the State as well as from distance regions of India, to settle and establish their business in the new Capital City, and offering them various facilities, privileges, concessions, compensations, rewards, safety and security.

(III) Establishment of the Royal *Karkhanas* and patronizing artisans, craftsmen and the local industries.

(IV) Organization of *Hats* (weekly markets), *Mandis* (special market) and Fairs, to facilitate the City with efficient marketing system.

(V) For smooth functioning of the markets- Nomination of a commercial agent in each market, checking weights and measurements, strict control over mal-practices, such as, hoarding, adultery, etc. in the markets.

From a number of *Parwanas*[165] issued by the ruler to the different traders, it is learnt that to encourage trade and commerce in Jaipur, Sawai Jai Singh invited traders from different parts of India to settle here. Jai Singh invited a good number of spinners and weavers from Chanderi and Agra which were centers of textiles industries and induced them to settle permanently in his State by providing many facilities[166]. From *Dastur-Kaumbar* No.23 we know that Thakarsi, Bulaki and Beg Mohd., were vendors of Agra, came to Jaipur in V.S.1784 (1727)[167]. Thaman Das who was skilled in the weaving of velvet and *Phanta* Cloth came to Jaipur from Gujarat[168]. Shahaj Ram a renowned enamellist of Jaipur, originally belonged to Delhi[169]. Heerji Behari, Indra Bhan, Ami Chand, gem-settlers and goldsmiths, came here from Delhi[170]. Ghasiram Murlidhar was invited from Gujarat[171].

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[164] The interaction is apparent from the fact that the goods produced in rural areas and the goods manufactured and imported in towns and city were regularly marketed in urban centers or the chief *mandis* of Jaipur and out-side of it.

[165] *Parwana* to Ram Sevak, Ram Kishan and Lunkaran Natani, dated *Bhadrapad Sudi* 12, V.S.1786/1729AD, *Muwazana-Kala*, Jaipur Records.

Several incentives were offered to them like free land for constructing shops and houses, exemption from commercial taxes and security against harassment, loot and rapine. State-loans were advanced to build their houses with returning facility in easy installments of 10 percent. The ruler also stood surety for loans taken by the traders from *Sahukar* (money-lender)[172]. In the initial stage, partial and full exemption from the payment of taxes was granted to the traders in lieu of their agreeing to settle and carry on business in the State. There are many references in the Jaipur Records[173] indicating the exemption in the payment of *mapa, rahdari, don* and such other taxes by the State. To encourage the trades and skilled craftsmen, *siropao* or robes of honour in cash and kind were given to them[174]. Many a time *jagirs* were also bestowed on the traders besides the costly presents of elephants, horses and jewels[175].

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[166] *Siyah-Vaqiya* (Jaipur), *Kartik Badi* 4, V.S.1781/1724AD, No.180. Jaipur Records.

[167] *Dastur-Kaumwar* (Jaipur), Vol.23, ff.379, 557, V.S.1784/1727AD, Jaipur Records.

[168] Ibid, f.395, V.S.1786/1729 AD.

[169] Ibid, V.13, f.431

[170] Ibid, ff.401-403

[171] Invitation Letter dated *Miti Madva Sudi* 9, V.S.1786/1729, Jaipur Records.

[172] On account of these concessions received from the government, the traders earned enormous profits; so much is that even the big state officials and *Jagirdars* borrowed rich sums from the traders. In case the *Jagirdars* could not pay back the loans, they granted the right to the *Sahukars* to realize the revenue of certain villages in lieu thereof, cf. Gupta, B.L., *Trade and Commerce in Rajasthan*, p.243.

[173] *Dastur-Kaumbar* (Jaipur) No.23, ff.305, 395, V.S.1791/1734AD, R.S.A., Bikaner.

[174] Thaman Das Gujarati, who spun velvet and *phanta* cloth, was given a scroll of cloth worth Rs.68, in *inam* or reward by the Jaipur *Darbar*. A sum of Rs.400 was given like-wise to Gopal, a mason, for excellent building work done in *Chhabi-Niwas* at Jaipur. In V.S.1791/1734AD, Fateh Mohd.. a blacksmith, was given a *shiropao* worth Rs.6 & *Annas* 2, for the manufacture of canon - *Dastur-Kaumbar* (Jaipur) No.23, *ibid;* Worth Rs.6 along with Rs.20 in cash was given to Pema, a carpenter of Amber for the manufacture of a chariot for the royal use- *ibid*, f.483, V.S.1781/1724AD; In *Dhar*, a sculptor of Jaipur, was awarded with a piece of flowered *thermaphashmina* worth Rs.13, and a scroll of cloth for making a statue of the late Maharaja Sawai Jai Singh, *Ibid*, V.23, V.S.1812/1755AD, Jaipur Records, R.S.A., Bikaner.

[175] Cf. Gupta, B.L., *Trade and Commerce of Rajasthan during the 18th Century*, p.243

As a result of such initiatives taken by the State, a large number of traders, merchants, artisans and craftsmen from the neighbouring provinces of Agra, Delhi, Gujarat, Malwa, Lahore, Multan and even from Qandhar (Afghanistan) came zestfully to Jaipur. the outside traders and skilled artisans also felt encouraged by the fact that Jaipur State was comparatively free from the political turmoil and chaos being experienced or prevailed elsewhere in India. They were assured of their safe journey and promised to give many lucrative facilities and privileges.

As the trade-routes in those days were not quite safe, the government took necessary measures in right earnest in the safety of traders and their free movement. There are a number of references in the records to show that soldiers were posted at strategic points to keep the roads safe from the attacks of the free robbers. The security measures were taken by the traders. On the receipt of request of traders (*carvan*), when they suspected trouble on the way, armed guards were provided by the govt. to escort them safe and sound. In case the traders who were looted or deprived of their merchandise during the course of journey by dacoits or local *Jagirdars,* every effort was made by the State to recover the goods and provide them with compensation. Severe action was taken by ruler against the *Jagirdars* when it was discovered that they were a party to the plunder.

The officials posted at the check-posts or in the *Pargana*-headquarters, were instructed from time to time not to take unreasonable dues from traders passing through the check posts in their jurisdiction. The employees were also instructed not to stop the traders unnecessarily or harass them in any way at their check-posts. They were repeatedly reminded to make necessary arrangements to keep the roads safe and to guard the traders passing through their territories. In the archival records there are several instances which show that when a *carvan* passed through a *Pargana*, the govt. sent *parwanas* to the *Pargana* officials to escort them safely. In case the traders were looted, they were asked to make sincere efforts to recover goods from the dacoits, and in case of failure, the officials had to pay the losses from their own pockets. An interesting feature discovered from the records is the help taken by the traders from the *Charans*[176] while moving with their goods from place to place. Any harm done to the *Charans* were regarded a sacrilegious act. They came to the rescue of the trader whenever the traders were attacked by plunderers[177].

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[176] The *Charan* was a highly respected community of Rajasthan.

The ruler took keen interest in the growth of indigenous production which was preferred while making purchases for State's use[178]. By establishing *Karkhanas* in the City the State gave patronage to artisans and craftsmen of various description, local as well as migrants, trained them in their respective vocations and ensure a consistent out put of utility items, arts & crafts from them. The artisans employed in the royal *Karkhanas* or engaged in private industries, which were usually managed by skilled artisans, received patronage of the State in production. It was because of State's effort that a large number of skilled craftsmen from all over the country came and settled in the Capital City of Jaipur and as a result handicrafts received a great impetus.

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[177] Gupta, B.L., *Trade and Commerce of Rajasthan during the 18th Century, op.cit.*, pp.243-244; It is, however, interesting to find that the trade routes spread throughout Rajasthan were not comparatively as subject to attacks and plunder as elsewhere. The trade *carvans* were rarely the target of the Maratha invaders in Rajasthan.

[178] *Kirkira-Khana* (Jaipur), *Chait Sudi* 13, V.S.1796/1739AD, Jaipur Records.

CHAPTER SIX

WATER MANAGEMENT SYSTEM

All large cities require that the supply of drinking water for the citizens should be assured and plentiful. Since Jaipur is not near any perennial river and in the absence of any perennial source of water, rains- being it's only source - were and are only for three months[1]. But the need of water remains for the whole year; this posed a difficult problem for the planners of the City. It made essential for the rulers of Amber to collect and store rain water through different means and so they planned and constructed various types of water bodies which I came across in Jaipur during my archaeological-survey of the region.

During the course of conducting the physical survey of the walled city of Jaipur and its surrounding area, and then after corroborating it with the relevant contemporary sources, I found that in the area there was an elaborate system of water management- rain water collection, its conservation and supply system. The whole system was made in such a way that every effort was made to ensure the optimum utilization of it and no wastage of water was allowed. In the area, there found many types of masonry water bodies which may be categorized as: water bodies for storage, inlet and outlet channels or the distributory channels, water cistern or the filtration chambers water works for pleasure. The water management system of Jaipur was composed of canals, ponds, reservoirs, dams, tanks, *kunds,* wells, step-wells, channels, aqueducts, etc. Basically this system facilitated the conservation of rainy water and its distribution for catering the various human needs within the City and outside as well. Besides, a precaution has been taken to device the water system in such a way that it may be available for cattle and other animals.

From the contemporary records it appears that Sawai Jai Singh was very much concerned about the water supply for his new Capital, and he had given attention to this problem from the very beginning. Old City-Maps[2] of Jaipur available at the City Palace indicate his concern and also the techniques of canal construction of that period. Before executing the plan, the natural resources and their entire routes had been surveyed and plans were prepared accordingly, which show height of the pillars and depth of water at different distances.

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[1] The annual rainfall for the State of Jaipur is said to have averaged around 23 inches.

[2] G.N. Bahura, *Catalogue of Historical Documents of Kapad-Dwara, Jaipur* ['Kapad-Dwara Catalogue'], Jaipur, Vol.II, *Maps and Plans*, Jaipur, 1990, Map Nos. 116, 119, 214, 232, 300, 301, etc. An examination of these maps reveals that proper arrangement for water supply was the focal concern of the ruler of Amber while planning the City of Jaipur.

The rivers – Jhotwara, Banganga, Banas, and Darbhavati - were surveyed and the natural channel of each was taken into account. It was noted that Jhotwara was in the north-west of the City; and while the Banganga ran beyond the eastern terrain of hills, it originated in the south-east of Jaipur[3]. Banas was in the south of the City and all its lower courses were within the limits of Jaipur. River Darbhawati forms the theme of a number of contemporary maps and documents related with the City's foundation. The water for the Jaipur City could be collected from the rivers Darbhavati and Bandi, which join each other[4]. Wherever the natural course of the river water could be used, it was drawn on maps and described in the related description and estimates and actual measurements of lengths of the water courses were made later[5]. The general direction of drainage is towards south in the southern part of Jaipur; towards east in the eastern part and towards north-east in the northern part.[6]

The work was started on a canal to bring water from the Jhotwara River to the new city then under construction. The preliminary proposal about this project (canal construction) was submitted in July16, 1726 A.D.[7], The Jhotwara River in the north-west was diverted through the 'Amani-Shah-Nallah'[8] and a number of canals were channelised through 'Brahmapuri' and 'Jainiwas' to supply water to the City[9]. Another City Map[10] shows a canal, constructed of bricks, *Kirajal*[11](near the 'Man-Sagar' Dam) to the Jainiwas[12]. This canal also supplied water to the nearby villages.

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[3] Shyamal Das, Kaviraj, *Vir Vinod*, Vol.II, *Op.cit*, p.1249.

[4] *Kapad-Dwara Catalogue*, Vol.II, *Opcit*, Map Nos. 26 and 116, dated 1725-50 AD.

[5] Ibid, Map Nos. 28, 128 and 130.

[6] *Rajasthan District Gazetteer- Jaipur*, *Op.cit*, p.5.

[7] *Arzdast, Shravan Vadi* 13, V.S.1783/1726 AD - 'Anand Ram to Jai Singh', the writer informed that a canal from Bandi River, about 9 *kos* from Jainiwas, would prove a more difficult and lastly undertaking that one from the Jhotwara River, which was about 2 *kos* from the palace, and intervening sand dunes were also not very high; cf. V.S. Bhatnagar, *Sawai Jai Singh and his Life Times*, p.331.

[8] The 'Amani-i-Shah' or 'Amani Shah-Ka-Nala' originates in the foothills north of the Jaipur City, it supplies the city with sweat drinking water, and joins the river, Dhund south of Sanganer after flowing 35 kms, in it water sustain whole year, *Vir-Vinod*, Vol.II, *Op.cit*, p.1249.

[9] *Kapa-Dwara Catalogue*, *Op.cit*, Map No.312.

[10] Ibid, Map No.287.

[11] A kind of water body which was built for entertainment.

[12] The length of this canal is mentioned in the map as 2.5 *kos*- Map No.287, *Op.cit*.

Kapad-Dwara Map Nos. 29 and 61 give a vivid description of a canal joining the river Banganga along with its length and slopes, the height of the pillars at many points, depth of water at different levels and other measurements which are given in yards. It also refers to a *Talab* or the water tank built in front of Banganga. The canal of 'Sawai Jai-Sagar' is also depicted on the map according to which it also originates from the Banganga. The lengths from (mound at) Ramgarh to Dundh is 6800 yards and the height is 45 yards, the slope (*dhal*) is 9 yards - Till the gate (*darwaza*) and wall (*motia-kot*), the length is 1400 yards and the slope 4 yards - 'Pitambar Bohra-ki-Baoli'- from mud-wall to big gate (*barha-darwaza*) the length is 1650 yards and the slope is 19 yards - From big gate to opening (*mori*) for Jai-Sagar, the length is 480 and the slope 19 yards – Raised edge (*pali*) of Jai-Sagar[13].

To facilitate water supply to the City, he planned a canal from a nearby stream 'Darbhavati'[14], and some distance to the north-east of the City, between Jaipur and Amber, it was dammed[15] to create the 'Jai-Sagar' and 'Man-Sagar' lakes[16] (that later housed the 'Jal-Mahal' or the Water Palace). The tract, at present occupied by the lake, Man-Sagar[17], created by this dam (*Bund*) was formally a marshy land. It also formed the bed of a rivulet which passing through a narrow gorge in the hills[18] used to flow towards the north-east. This rivulet called 'Darbhavati', which was dammed[19] in V.S.1792/1735 A.D. during the period of Sawai Jai Singh, and it was built under the supervision of an architect Ganga Ram[20]. The Man-Sagar Dam at the river created a reservoir serving two purposes i.e. supplying water as well as afforded protection to the City. This dam is a massive masonry structure truly illustrative of the type of dams noticed by Babur on his march to Chanderi, i.e. dams built "across between hills"

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[13] Ibid, Map Nos.119, 125.

[14] Though, no such river or stream exists today, and historians of the Jaipur City have speculated on the problem of identification of the stream for many year. A reference to the ruin of an ancient barrage near Jaipur in one of the older reports of the state Public Work Department has helped in identifying the old course of this river- Roy, A.K., *Op.cit,* p.xiv. Maps related with 'Darbhavati' which forms a conspicuous part of the Collection (*Kapad-Dwar*, M. S. Man Singh II Museum, Jaipur), at Jaipur also help in identifying the course of the river.

[15] See Plate No. 24 (B)

[16] This is borne out by the Map No.56 (in the *Kapad-Dwara Catalogue*, it is listed at No.29 and entitled as *"Tarah Sawai Jai Sagar wa Mansagar"*) that a lake in the vicinity of the main palace, which it identifies as 'Jaisagar'. According to Jaipur Palace traditions, Jaisagar was renamed 'Ayamal-Sagar' by Jai Singh Sawai . From this one may infer that this particular map, which also depicts Man-Sagar Dam, was prepared at a time when the above lake was still known as Jai-Sagar, i.e. some time during Jai Singh Sawai's reign when it had not yet been renamed Ayamal-Sagar. The fact that Man-Sagar Dam also figures in this map goes to suggest that it existed during Sawai Jai Singh's reign, "The Man-Sagar Dam of Amber", *Op.cit*, pp.4-5.

[17] See Plate No. 24 (A)

[18] See Plate No. 24 (B)

[19] See Plate No. 25 (A)

Inspection of Man-Sagar Dam and its surroundings reveals that it was built on 'trabeate' principle with stone, rubble and mortar to play a gorge. Its length, along the down-stream wall and over the opening left for the spillway, measures about 202 meters. The dam thus creates a reservoir on its western side[21] that extends up to the road connecting Jaipur with Delhi. 'Jal-Mahal' built by Sawai Jai Singh in 1734 A.D. stands on an island close to the southern bank of the reservoir[22]. According to a noting on one of the old city maps, the bed of the reservoir slopes in the west-easternly direction. At the base of the dam, according to this noting it is "3.5 yards' lower than its level near the steps of Jal-Mahal. A huge tank was also constructed below the Man-Sagar Dam.

According to the 'Technical Report' of the State's Irrigation Department[23], the catchment area of the lake in the surrounding hills measured approximately 10 square miles (16.09 kms.) and "the full tank level (of the lake) before any modifications in the structure were carried out, stood at R.L. 117 FF/35.66m.". Water flowing out of the Man-Sagar irrigates at present about 1648 acres/667.206 hectares of land. There are two canals that originating on the down stream side of the dam flow towards the east. One of them that originate at the spillway is clearly depicted in the Archaeological Survey Sheet no. 45, N/13. There are two sluices for the outflow of water, one on the left end the other 95 meters to the south of the first. These sluices form the only existing outflow discharge from the tank and the surplus capacity of this tank was inadequate in comparison to the inflow received into the tank[24].

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[20] *Dasrur-Kaumwar* (Jaipur), Vol.23, V.S. 1792/1735 AD, Jaipur Records, R.S.A., cf. Bikaner; G.N. Sharma, A Bibliography of Medieval Rajasthan, Agra, 1965, p.42; Iqtidar Alam and Ravindra Nath, who surveyed the Mansagar Dam three decades ago, suggest that the specialized knowledge relating to the problems of dam building that is clearly reflected in the basic design of the Man-Sagar Dam was probably acquired by Ganga Ram from an indigenous tradition, see for details, Iqtidar Alam & R. Nath, "The Mansagar Dam of Amber: A detailed study of its structure and working", in Annirudh Ray and S.K. Bagchi (eds.), *Technology in Ancient and Medieval India*, Delhi, 1986.

[21] See Plate No. 25 (A)

[22] Ibid.

[23] This report was prepared by the Irrigation Department, Government of Rajasthan, under the title *"Remodelling of Man-Sagar Bund and Canals System"*, in 1978 as to make some modifications in the dam structure so that the Jaipur- Delhi road may not get submerged.

The whole structure of the Man-Sagar Dam can be divided in three distinct parts – (a) The structure up to the plinth level; (b) The super- structure rising from the plinth in successive storeyes; (c) The fortification represented by a battlemented rampart rising on the downstream side of the super-structure. About the basic nature of the structure and the building technique, and devices used for ensuring the functional viability of the dam, some important points are as follows:

Firstly, it may be suggested that the Man-Sagar Dam is an interesting specimen of a gravity dam built on the trabeate principle. The exclusive use of the trabeate principle in this dam tends to suggests that it represented a pre- Turkish tradition of dam building. This tradition appears to have survived, in the territories dominated by the Rajpurt chieftains, down to the beginning of the 18th Century. Secondly, an awareness of the basic problems of the dam engineering such as preventing a tension failure on the part of the architect who designed this dam. The fact that Man-Sagar Dam is still operational and that in A.D.1981 it survived the fiercest floods in living memory testify to its accurate planning. Thirdly, the sluices in the dam was designed in the form of small tanks located between the lake and openings of the tunnels carrying water across the dam with an aim to regulate water discharge, to prevent silting of the tunnel and also to protect the mouth of the tunnel from seeping and erosion resulting from continuous contact with and pressure of the lake water. And, finally, the battlement rampart, atop the downstream wall of the dam continues on the flanking hills. The Man-Sagar Dam was originally planned to strengthen a fortification aimed at securing the outer fringes of the military purposes. Firstly, it strengthened the defense of the fortified space by providing a source of continuous water supply; secondly, it served as a bulwark blocking entry into the fortified space.

The river Darbhavati runs from the Saiswara Gate[25], and there are sand dunes in the water, due to which the water can be drawn by two *charas* (Persian-Wheel) till the month of *Chaitra*. The Bhav-Sagar is brought from the Pali River measuring 170 yards and the places touching the water are stated in the records. Ten *charas* draw water from the Bani River from where the canal starts. Water was also conserved through draining streams towards Man-Sagar in 1735 A.D.[26] The canal of Bishan-Sagar from the River Darbhavati was brick land and 40 *bighas* of land is recorded to have been dug up for this purpose. The account of the Jhotwara Canal, north-west of Jaipur City, shows the area to be sandy. The canal was very deep and steps (*chotthi*) were sunk in the sand[27].

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[24] The Technical Report proposes that the capacity of the spillway be increased and a gateway be introduced to regulate the flow through it. Through the device the Technical Report planned to bring down the F.T.L. from R.L. 117 ft/35.66 m to R.L.116 ft./35.36 m; which was apparently necessary for avoiding the inundation of Jaipur- Delhi road.

As Temples and gardens were a regular feature of different areas, so water-supplying to these gardens by means of canals was also found in Jaipur. Thus, a listing of such gardens and sources of water was undertaken. There was a separate state-department, called *'Bagayat'*, which looked after these gardens. Map No. 107[28] indicating the area around Brahmapuri up to Amber with prominent gardens, such as, garden of Purohit-Gangaram, Samratji, Sarkar, 'Naulakha-Bagh', 'Chandra-Bagh', 'Nand-Bagh', 'Vijay-Bagh' and 'Man-Bagh', and 'Vyas-Kund' (Tank), *'Mia-Ki- Sarai'*, and a Jain temple.

Another City Map[29] shows the area, from 'Talkatora'[30] in Jainiwas to 'Kanakbagh', was dotted with so many reservoirs. To the east of 'Talkatora', there were two water reservoirs, popularly known as 'Rajamal-Ka-Talab' and 'Bhagwant-Sagar'[31]. Talkatora and Rajamal-Ka-Talab, both were within *Sarhad* or the boundary of the Palace Complex. Talkatora, which exists in the northern part of the Palace Complex, is still in preserved condition, but Rajamal-Ka-Talab was filled up[32] later on. Another water body

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[25] It runs below Nahargarh: Vidyadhar *Diwan* was conferred honours for bringing it to Sawai Jaipur,

[26] *Datur-Kaumwar* (Jaipur), Vol. 23, V.S.1792/1735 AD; Also see *Kapad-Dwara* wherein the plans of Man-Sagar and Jal-Mahal are referred to – Map No.198; Step by step construction is recorded right from the digging of the foundation and the construction of a sanctum (*garbagriha*) – Map No. 216. The water was channelized towards Man-Sagar from Jhotwara. Guni, Matol canals which ran towards Saraswati, since in the four months water was plenty, therefore it was directed towards Man-Sagar – Map No.283, Sumbul Halim Khan, "Planning the Pink City: Maps and Documents", *Indica* – 35, The Heras Institute, St. Xavier's College, Mumbai, 1998, pp.34-35.

[27] In the second half of the 18th Century, the Akaida Tank was constructed. It was brick-laid because of the sandy soil. Its measurements are also given in the records. The water of this tank was used mainly for washing clothes (at the *dhobi-ghats*) – *Kapad-Dwara* Map No. 120; Planning of the Pink City, *ibid*, p.35

[28] *Kapad-Dwara Catalogue*, *Vol.II, Maps and Plans, Opcit*. This map is dated 1700-1725 AD.

[29] *Kapd-Dwara Catalogue*, Map No.287

[30] See Plate No. 25 (B)

[31] *Kapad-Dwara Catalogue* Map No. 121 is entitled as *"Tarah Bhagwanta Sagar"*.

[32] It was filled up during the period of Ram Singh-II and at present, an Ayurvedic College is exists there in its place.

'Santosh-Sagar' is also referred in the city maps Again. The *Kapad-Dwara* maps, listed as No. 249 and 251, show the work being done in 'Jagannath-Sagar', a water body in Brahmapuri named after Jagannath Samrat, and at the *Ghat* near Paundarik-Haveli with a water-outlet for Jainiwas. These water bodies were interconnected by a network of masonry canals and aqueducts or conduits.

'Talkatora' is a masonry water body in the almost square shape with the length 288 Yards and the breadth 286 Yards. It is enclosed by the high masonry walls from all sides, except the northern one, where it is partially opened. Inside this water body an octagonal masonry structure, attached to the boundary of each side, except northern one where it is situated towards inside, is built. The water was raised or lifted from this Talkatora to the Badal-Mahal or the Cloud Palace, which was linked to Jainiwas or the Palace Garden and the City Palace through a continuous chain of the water channels and fountain tanks. In this way water was supplied from the Talkatora Lake to the Palace and other buildings within the Palace Complex. And, water was supplied to other blocks of the City from the Rajamal-Ka-Talab, which was connected to the water tanks, built in the central squares of the City, through underground aqueducts or the conduits.

The water supply system was further augmented by water bodies known as *'Kunds'* existing in the centre of 'Bari-Chaupar'[33] and 'Choti-Chaupar'[34] which are linked further to wells and *'Baolis'* or the step-wells in the inner streets through underground aqueducts or conduits. The old city plans[35] mention the wells placed alongside the planned street and the other streets which joined it. Map No. 170[36] refers to a well of the 'Tikkiwals', along with a temple and a 'Kagadya' (Paper-makers) Mosque. Two other contemporary maps[37] of the City also refer to a *pukka* or the masonry well and a sweet water well. Thus, the analysis of the above mentioned sources signifies that there was an integrated system of water conservation and its management, and water was not only stored, carried over long distances but also distributed among the various parts of the City. The structural characteristics of these *Kunds* or enclosed tanks- judicious disposition of steps and flights of steps turned the *Kunds* into objects of great architectural merit. These *Kunds* having enclosed a limited area made provision for letting water in and out of the tank in a controlled way.

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[33] See Plate No. 15 (C); Jaipur City underwent significant transformations in the period of Sawai Ram Singh II (1835-1880 A.D.) when the earlier water bodies of the 'Rajamal-Ka-Talab' and *Kunds* in *Chaupars* or the Squares were filled up and new water pipe lines for water supply were installed in the city and so the original water system became redundant.

[34] See Plate No. 19 (C)

[35] *Kapad-Dwara Catalogue*, Vol. II, *Op.cit*, Map Nos. 119, 200 & 204.

[36] Ibid; This map is dated 1700-1725 AD.

[37] Ibid, Map Nos. 106 and 133 dated early 18th Century.

In the survey of the water bodies of the City, a number of step wells are found, though some of them are now redundant. A *'Baoli'* or Step-well was a much more enlarged and highly advanced version of a well or stepped-well[38] with a flight of steps so as to make access to the water easy. It combined the utilitarian aspect with a pleasure resort[39]. The structure of the *Baoli* or Step-well is tiered with the steps leading down wards from one storey to the other such that the lower tiers would emerge as the water table declined in the dry seasons. This stepped arrangement allowed the users access to the water level even during the dry seasons. The tiered galleries are also widely used as spaces for rest and are often ornamented by elaborate relief sculptures. The *Baoli* may differ in terms of their design and the structure of the steps. Although the 'Kale-Hanumanji-Baoli' was built on what was originally the outskirt of Jaipur, its location has come to be a densely populated area of the City. The *Baoli* derives its name from the temple of Hanuman across the road from it. A step-well, known as 'Jagga-Baoli', was located towards 'Galtaji'. Unfortunately it is presently in a very dilapidated condition.[40]

The new city was linked to the old hilly fortress city at Amber and to the two forts of 'Nahargarh'[41] and 'Jaigarh'[42]. These forts are like any other fort with one exception, i.e. they have an elaborate system of collection and storing water. Amber has a large number of water bodies -lakes, *Kunds* or tanks, *Baolis* or step-wells, etc, some of them deserve mention here. One of these is the 'Maota' Lake[43] located below the hill top Palace Complex of Amber. Another is the old lake 'Sagar'[44], situated in the valley to the hill top palaces i.e., to the north-west of the Jaigarh Fort, was also an important source of water. Among Amber's numerous tanks, reservoirs and step-wells, the 'Khasa-Baoli' a three-tiered step-well, with arches and walk-ways, is note worthy. Another significant water structures or *Baoli* at Amber is the 'Punna-Mian-Ka-Kund'[45], build by Mian Panna, who is reputed to have been a eunuch in the service of Bishan Singh and his son Sawai Jai Singh II, this structure has four octagonal *'Chhatris'* or the pillared verandahs[46].

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[38] Step-wells were an important part of the social life of the people and an integral part of their social fabric. The people in the area would come to the step-well to rest and socialize, protected from the summer heat. Further more, the step-wells location in temple compounds and on trade routes granted them the position of a traveler's heaven, a place of business and wedding transaction. Royal havens and summer parties were also held in the premises of these Step-wells. In Western India, particularly Rajasthan and Gujarat the step-well was converted into an architectural monument of beauty.

[39] The *Baoli* still holds water and ought to rightfully have been a resting area for pilgrims or visitors to the temple; it no longer serves its intended function due to the well having been littered with all manner of garbage.

[40] Its dilapidated state has been used it in a dumping well for their garbage up until recently when the *Baoli* has been cleaned and restored to its original function.

[41] See Plate No. 23 (C)

[42] See Plate No. 26 (B)

The Nahargarh Fort had a far more elaborate water supply system. It has a number of open tanks at various levels for collecting and storing rain water[47]. Rain water was channelized by masonry walls and other supports all along the hills, and stored in a number of water bodies built within the fortification walls. Towards the western side of the main palace, two large storage *Kunds* or the tanks[48] are accessed by a long series of steps that snake downwards to the water level forming a crescent shape. Direct access to the water is also provided through another series of steps which proceed straight from the top to the water level. There are a number of channels that are covered with stone slabs and lead from ground level to the storage tanks below[49]. Small tanks that were separated from the main tanks were also created on a side, and the water from these was reserved for the animals that were housed in the fort. To the north-eastern side of the palace, there exists a beautifully structured step-well in nearly triangular shape which shrinks downwards[50]. Together the system used at this *Baoli* served to efficiently harvest all of the regions scanty rain water.

The water supply system in Jaigarh is one of the most significant features of the fort. This fort is self-sufficient with respect to its water requirements. Water, being the basic necessity, was most meticulously preserved and more conscientiously used. Here, the tanks could store water for thousands of men for years together. The catchments area of rain water[51] for Jaigarh extends to about 4 kilometers from the fort. A network of drains, small canals and their arteries are laid in and out-side the fort. All along the hills paved ways were constructed of brick and lime mortar[52]. Rain water was channelised along these into small canals or plastered channels, which were connected with the main tanks inside the fort. These small canals bring rain water from the higher reaches of the hills. The bed of these canals is designed in such a way that it is on a gradient and also at the same time has an undulating course. This allows the sand to settle in the low of the canals. This also helps the water to flow swiftly in the canals. Water was allowed to drain or overflow through open or covered ducts made of stone or brick and lime mortar[53] to huge reservoirs. There are also many small tanks on the path of the canals which allow the small stones and other waste material to settle down in these tanks. Structures similar to silt traps had been constructed to ensure that the dirt settled in such traps and only fresh water reached the tanks. Water of the first one or two rains was channelized into the open tank in the south-east of the fort[54], by closing the gate of the canal loading to the main tanks. This not only allowed the contaminated water of the first few rains to fall into the open tank[55] but also wash the canals of the dirt and filth. The water of this open tank was used for horses and other animals. Only fresh and clear water was allowed to collect in the main tanks[56]. Even today water is collected in Jaigarh in this same old. The inmates of the fort use this water for drinking and cooling.

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[43] See Plate No. 29 (D)

[44] See Plate No. 28 (B)

[45] See Plate No. 29 (C)

[46] The cenotaphs of King Kuntal and his queen, Ladan Devi are near this 'Baoli'.

[47] See Plate No. 28 (C)

[48] See Plate No. 28 (D) & 29 (A)

[49] See Plate No. 29 (A)

[50] See Plate No. 29 (B)

There are five main *'Tankas'* or big tanks inside the fort. Three of these tanks are in the southern courtyard of the fort and the other two in the north-east corner of the fort (the fourth is near the 'Aram-Mandir' in the garden). Four of these tanks were covered to prevent evaporation and the growth of bacteria, so to keep water clean. There are a few smaller tanks inside the palace complex, some of them are overhead tanks used for supplying water in the bathrooms. The largest tank in the southern courtyard is 158 ft. long and 138 ft. wide and 40 ft. deep. This tank is covered from the top[57]. The roof of the tank rests on huge arches supported by 81 pillars constructed inside the tank. The storing capacity of this tank is six million gallons of water. The second covered tank just adjacent to the bigger tank is smaller in size. This tank measures 69ft. by 52ft. by 52ft. there are nine holes in the roof of this tank and there is a room under each hole (it is said that the rooms were used as a treasury-house until the reign of Sawai Jai Singh II. It is argued that the wealth stored here was used for building the new city of Jaipur[58]. The third tank in this courtyard is the smallest. It is an open tank[59] measuring 61ft. by 52ft. by 27ft. The other two main tanks inside the fort are also covered from the top. The one in the 'Aram-Mandir' was used to fulfill the water requirements of the palace complex and the garden. The other in the north-east was perhaps meant for use in times of emergency.

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[51] See Plate No. 26 – (A) & (B)
[52] Ibid.
[53] See Plate No. 27 – (B) & (C)
[54] See Plate No. 28 (A)
[55] See Plate No. 27 (A)
[56] See Plate No. 28 (A)
[57] See Plate No. 28 (A)

Jaigarh's 'Laxmi-Niwas' Palace, which was constructed by Mirza Raja Jai Singh and further added by Sawai Raja Jai Singh II and Later by Ram Singh II, has a 'specific system of central heating', which kept the floor of the hall uniformly warm[60]. The long tunnels under the floor are connected to a furnace, which opens in the north-west corner of the tunnels, keeping the floor warm during winters. The ceiling of the furnace opens into a boiler tank above the bathrooms of 'Laxmi-Niwas'. Accordingly, one of the bathrooms had a provision for a steam bath, and other bathrooms[61] had provisions for hot and cold water[62]. The central heating system in the palace was a specific system by which the royal palace complex was kept warm during the winter season[63]. Looking at the total system, at these fortresses at the tops of the hills, one finds that no water was allowed to go waste, it being collected and stored for use. Thus looking at the total system of rain-water collection, storage and its management at these fortresses at the tops of the hills, one finds that no water was allowed to go waste, it being collected and stored for use.

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[58] Khangrot, R.S., *Jaigarh: The invincible Fort of Amber*, Jaipur, 1990, p.62.

[59] See Plate No. 28 (A)

[60] 'Luxmy-Vilas' ('Niwas') has a provision of putting cotton-stuffed curtains. The curtains were used in winter and when drawn made the hall air tight to keep it warm. These curtails are still preserved and are used in certain occasions. The hall allows a free access to breeze during summers when the windows are opened and the curtains are lifted up", R.S. Khangrot, *Jaigarh, Op.cit.* p.53.

[61] There is another complex attached to the bathroom which provides the facility for steam bathing. This complex is smaller in comparison to the other bathroom; measuring 13ft. by 10ft. it has a marble sunken bath-tub of the same size as in the other bathroom. This complex is also attached to a boiler tank. There is a round copper plate having a diameter of 2feet fixed at the bottom of this tank. Just below the plate is the furnace which kept the water in this tank warm. When the complex is closed from all sides (it has only a window as an opening) and water in the tank boils, it produces steam. Steam being lighter than air spreads in the whole complex which was used for steam bathing. The boiler tank and the other two tanks in the bathroom are connected with an overhead tank. It has 6 outlets connected with the taps in the bathroom and the steam bath, cf. R.S. Khangrot, ,*op.cit*, pp.54-55.

[62] Shikha Jain (ed.) *Princely Terrain*, ed. by, *Op.cit*, p.45; The doorway, in the north of 'Laxmi-Niwas', leads to the two toilets and the royal-bath. The peculiarity of the toilets is that one was meant for summers and other for winters. The one for summer has three windows which open out side the palace complex. It also has a hook on the ceiling which was used for hand-pulled *'Punkhas'* or fans. An opening on the wall was used for pulling the rope of the fan from outside. The other toilet meant for winter is closed, having fixed glass window panes. There is no hook for the fan on the ceiling. Instead, there is a Chimney through which the stream and gases escaped when the central heating system worked. The opening for the rope has not been provided in it. The structural design and the lavish use of marble on floor and the wells of the

The lake 'Sagar' to the north-west of the fort[64], as already stated, was also an important source of water supply in the fort. This lake is divided into two sections by means of a *pucca* or masonry dam and the rain water flowing from the southern and the western hills was collected in them. Water from this lake was carried by elephants in large leather begs and emptied into the tank below the western out walls of the palace. It was lifted up as it is done in wells. There was a lift system for water supplying from the lake 'Sagar'. Water from the lake 'Sagar' was collected in small tanks by means of masonry channels. Steps were constructed so that water could be lifted up to fill the tanks on a higher lever. The men on the bottom step would fill a container with water and hand it to the person on the immediately higher step, whom turn would pass it on to the person on the next higher step. In this way water was carried right up to the tank at the bottom of the fort walls. Once this tank was filled with water it would be further lifted up with the help of a pulley as is done in the case of a well"[65]. The water in the palace and other parts of the fort was supplied manually as well as mechanically.[66] 'Persian-Wheal' or

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bathroom give it an elegant touch. The central portion of the bathroom is 21 feet high, measuring 21ft.by 19ft. A small drain all around it was used to carryout water from the bathroom. In the western corner of this bathroom is a marble sunken bath tub. The tub is connected with two tanks on its either side. One tank was used for storing cold water and the other for hot water. The tank for hot water is connected with a boiler tank. It is evident that water from both the tanks was mixed in the tub to a required temperature during winter seasons; *ibid*, p.54.

[63] It consists of a circular furnace of 4 feet 5 inches in diameter and 3 feet and 8 inches in height. The furnace lies just below the boiler tank which boils the water in the tank also. The furnace has two openings, one towards the west and other towards the north. One opening is meant for putting in fuel and the other to allow regular flow of air inside the furnace to help in combustion. The roof of the furnace is the same copper plate which is the bottom of the boiler tank mentioned above. The furnace leads to a series of long and narrow tunnels laid under the floor of the palace complex. When the fuel was burned in the furnace, warm air gushed out into the small opening of the tunnels under the floor of the palace complex. Thus, the air circulating under the floor kept the royal palace warm in winters, *ibid*, p.55.

[64] See Plate No. 28 (B)

[65] Cf. Khangrot, R.S., *Jaigarh: The Invinsible Fort of Amber*, p.63.

[66] In the former case, water was carried by hardy labourers in large pots or pitchers from the tanks to the different parts of the fort. It is assumed that more then one pot was carried on a wooden plank or platform by two or more men. In the later case, water was supplied by filling the over head tanks in the bathrooms of

'Rahatghadiya' was generally used to raise water to over head tanks from which it was distributed to various chambers[67].

Thus, the above analysis signifies that there was an integrated system of water conservation and its management, and water was not only channelized, stored, carried over long distances, but also distributed among the various parts of the Jaipur City. The whole system was made in such a way that every effort was made to ensure the optimum utilization of it and no wastage of water was allowed[68].

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the Palace Complex. One such tank mentioned earlier is in the 'Laxmi-Niwas' Palace. Another over head tank near the dining hall was perhaps used for the fountains. Earthen pipes were used in the fountains. The pipes are in a perfectly working condition even today, *Ibid*, pp. 63-64.

[67] This device was extensively used in the City of Daulatabad (17th C. A.D.) and in the 'Later Mughal' period. The remarks on the river Darbhavati reflect that it runs from the Saiswara Gate[67], and there are sand dunes in the water, due to which the water can be drawn by two *charas* till the month of *Chaitra*. The Bhavsagar is brought from the Pali River measuring 170 yards and the places touching the water are stated in the records. Ten *charas* draw water from the Bani River from where the canal stats, as discussed earlier.

[68] The system is still working at the hilly fortresses e.g. Nahargarh and Jaigarh in the north of the City of Jaipur.

PLATE - 24

(A)

(B)

Distant views of Man-Sagar (A) from Jaigarh & (B) from Nahragarh

PLATE – 25

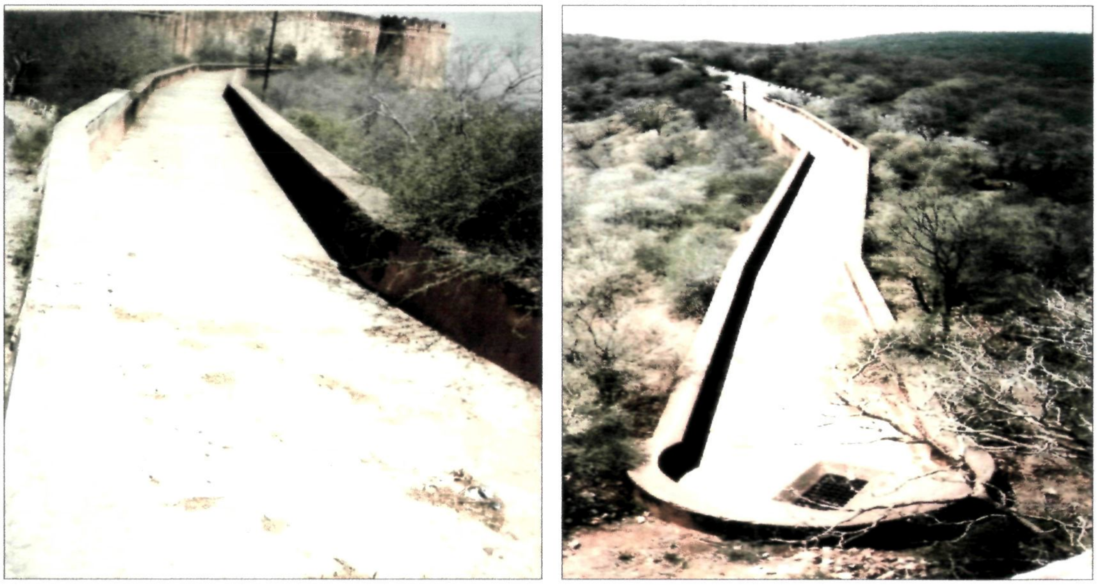
(A) A closer view of the Man-Sagar Dam showing the Water Palace

(B) Talkatora Lake, northern side of the Palace Complex, Jaipur

PLATE- 26

(A) (B)

(A) & (B) Rain-water encatchment areas at the Jaigarh Hills



(C) (D)

Views of the masonry water canal in the southern side of the Jaigarh Fort, showing the water hole which is connected with water tanks inside Jaigarh

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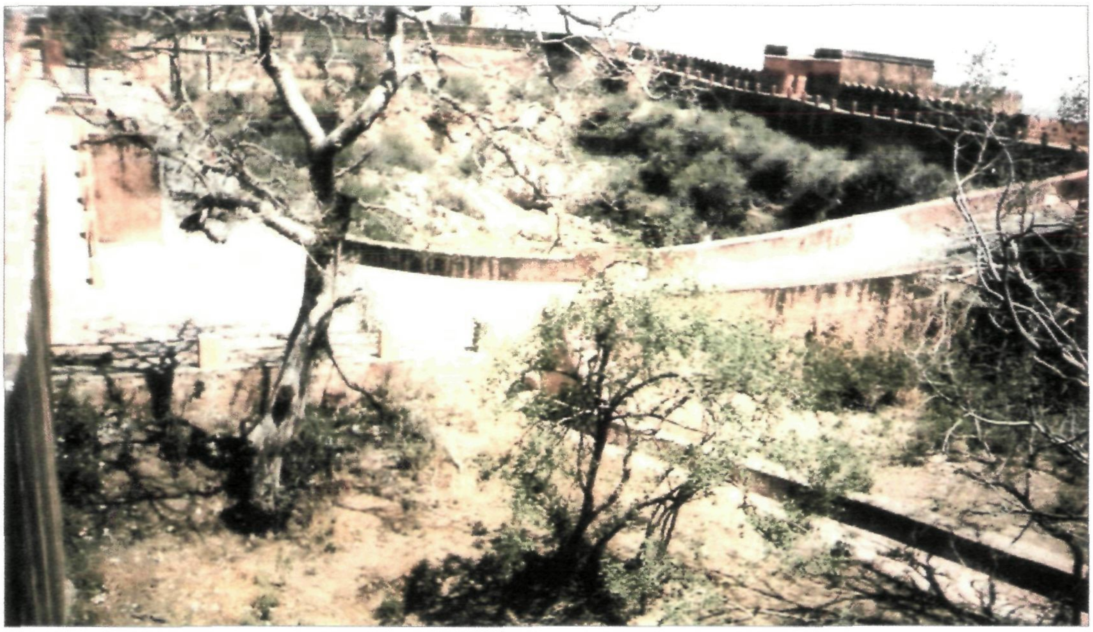
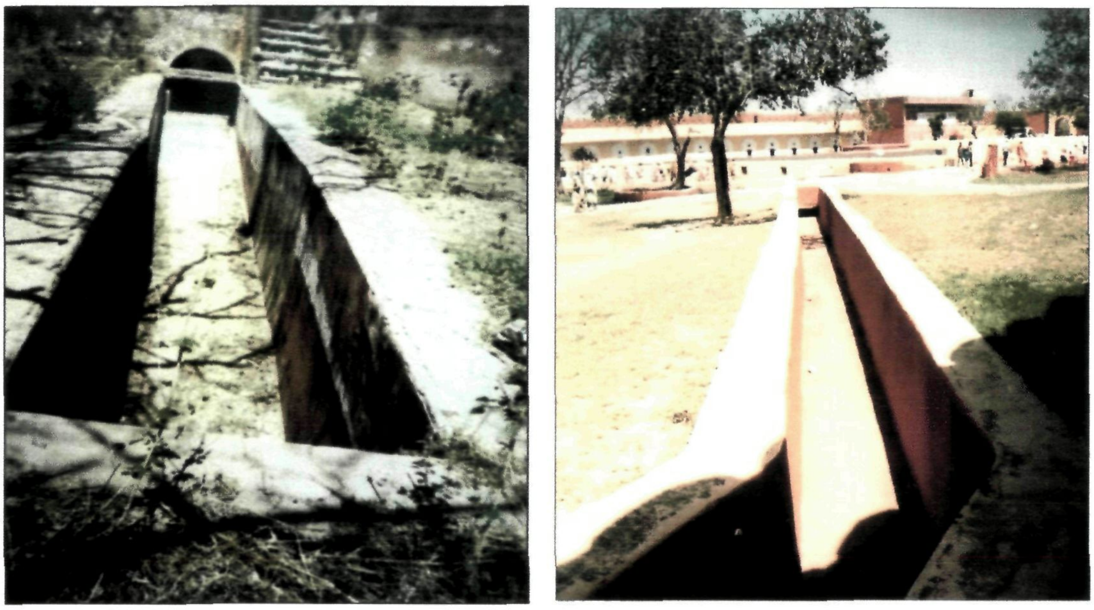
PLATE- 27



(A) Open Tank within the Jaigarh Fort, connecting the outer water canal



(B)

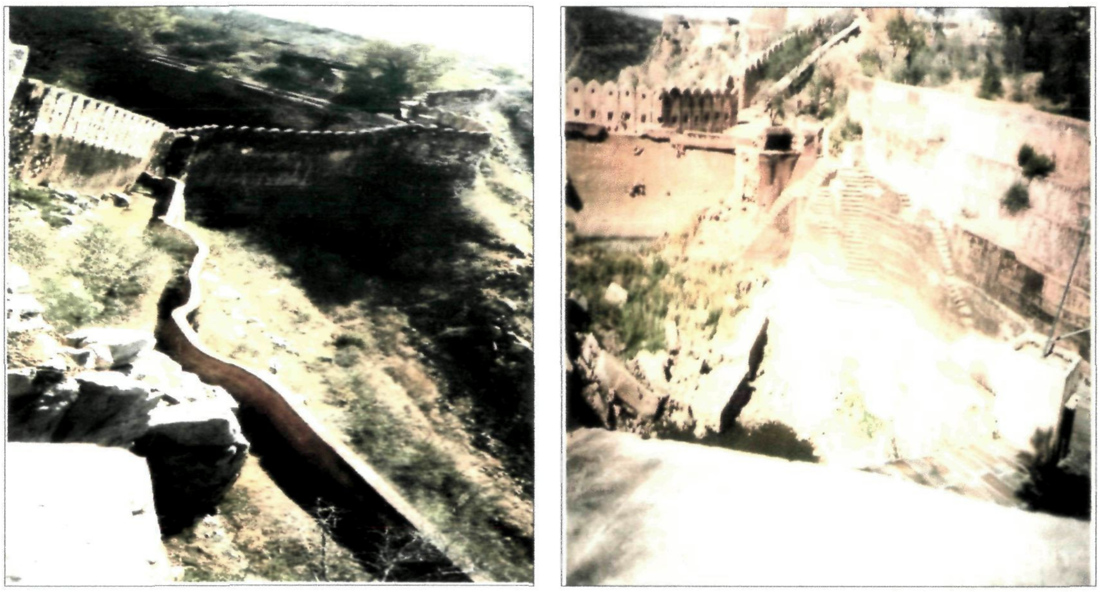
(C)

(B) & (C) Aqueducts connecting outer canal with the tanks inside Jaigarh

PLATE- 28

(A) (B)

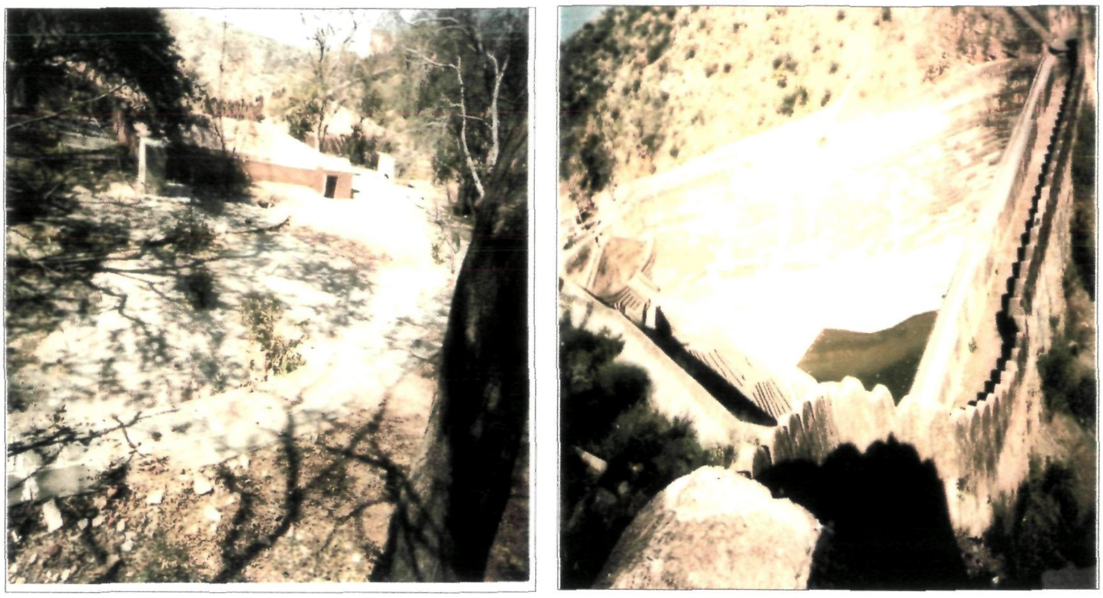
(A) An open & a closed Tank, Jaigarh & (B) A view of the lake Sagar



(C) (D)

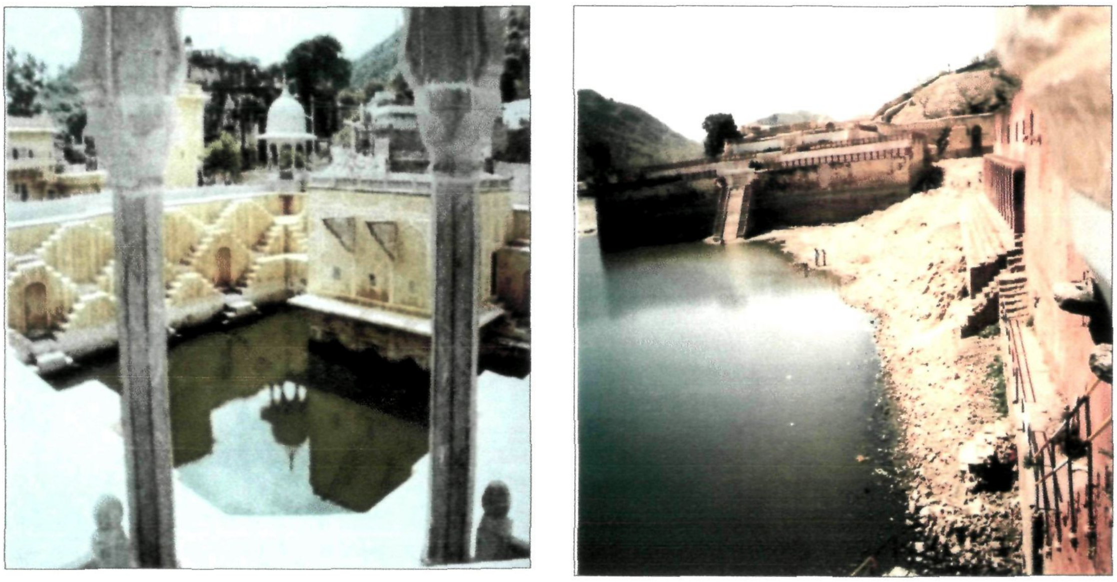
(C) Water-encatchment area & (D) A Step-well, at Nahargarh (western side)

PLATE- 29



(A) (B)

(A) Closed tank (northern side) & (B) Step-well (eastern side), Nahargarh



(C) (D)

(C) Panna-Mian Baoli or the step-well and (D) Maota Lake, Amber

CHAPTER SEVEN

CITY ADMINISTRATION

Jai Singh while founding his Capital City of Jaipur paid enough attention in providing efficient and effective administration to the City. He adopted the City Administration on the Mughal pattern but with some modifications as required by the socio-cultural environment of his State[1]. Though, the Amber had his own old system of administration[2], the new elements in it were adopted gradually during the period of Sawai Jai Singh and some elements were adopted even before Jai Singh[3]. It is very imperative to study the City Administration along with the nature and extent of authority wasted in the City officials, their duties and function.

I

A *Kotwal*[4] was appointed by the ruler at the Capital who was directly responsible to him. The *Kotwal* used to receive his salary in cash[5]. His main duties were to take necessary measures to maintain law and order and to protect the people[6], and for this he posted night patrols in the City, and kept an eye on bad characters and detected crimes[7]. He checked weights and measures, suppressed hoarding of food grains and other commodities[8], regulated the manufacture and sale of intoxicants in accordance with the prescribed rules[9]. His other duties were selling land for the construction of houses and shops, and issuing permission to make additions or alterations in the houses[10]. He also granted permission for the practice of various professions in the City[11]. The collection of duties or toll taxes, fines and other taxes, at the *Chabootara-Kotwali*[12] - a platform in front of his office, was one of his essential and multi-farious duties which he performed in the Capital with the help of his sub-ordinate officials[13].

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[1] The posts of the city officials, such as, *Kotwal* and *Faujdar*, and their duties and functions, were modeled after the Mughal *Kotwal* and *Faujdar*, with such modifications as were deemed necessary in view of the requirements of the State.

[2] Jai Singh's ancestor, Prithvi Singh, who fought against the Mughal Emperor Babur in the 'Battle of Panipat' (1526 A.D.) and died shortly after injuring during the 'Battle of Khanwa' (1527 A.D.), divided his whole kingdom of Amber into twelve regions, known as *Kotris*, each under his son who were latter called as *Thakurs*. As for as, the 'Town Administration' is concerned, in the old system, the town was divided into eight-wards known as *Waras*. A committee was constituted to manage the town. Each *Wara* sent two representatives known as *Varikas* who were elected for a year to the committee. The officer of the committee was known as *Sthana* and official such as *Kauptika*, *Karnaika* were appointed by this elected body. *Karnaika* was an in charge of records and correspondence and *Kauptika* used to collect market revenue, G.C. Sharma, *The administrative System of Rajput*, New Delhi, 1979, p.4.

[3] Raja Man Singh-I introduced the 'Pargana System' in his State on the Mughal pattern. The State of Jaipur was divided into a number of *parganas*, and a *pargana* was further divided in a number of villages, cf. Shyamaldas, Kaviraj, *Vir Vinod*, Vol.II, p.26.

[4] There were two categories of *Kotwals*, one was appointed at the Capital City and the others who were appointed at *Parganas'* head-quarters. The duties of the '*Pargana Kotwal'* were the same as that of the Capital but his status was low in compared to that of the '*Kotwal* of the Capital', G.C. Sharma, *Administrative System of the Rajputs*, New Delhi, 1979, pp.85.

[5] *Chithi qrar* (Jaipur), *Posh Sudi* 5, V.S.1790/1733 A.D., Jaipur Records, R.S.A., Bikaner.

[6] *Chitthi qrar* (Jaipur), *Posh Sudi* 5, V.S.1790/1733 A.D., Jaipur Records, R.S.A., Bikaner; The *Kotwal* maintained law and order in the City with the help of a *Faujdar* and *Naib-Faujdar*.

[7] *Chitthi* (Jaipur), 'Deep Singh to *Deewan* Naraindas', dated *Jyestha Sudi* 7, V.S.1793/1737 AD, Jaipur Records, R.S.A., Bikaner.

Since, in those days there was no separate police department, the ruler had to appoint army officials to maintain law and order in the civil areas. The police functions in the City were performed by the *Faujdar,* who was a military officer at the *pargana* level. *Naib-Faujdar* or the Deputy *Faujdar* assisted him in performing police duties in the City. The *Naib-Faujdar* was also responsible for keeping surveillance over the people and their luggage which passed through the City's entry gates. It appears that it was not possible to leave the City with any kind of property without a permit from the office of this functionary, as it is clear from the evidence given by a *Naib-Faujdar* of Jaipur in a trial case [14]. If any person wanted to leave or enter the City with his property, or send off his property of any kind, he had to apply in the office of the *Naib-Faujdar* for a chit or pass to the *Chowkee* or the check-post at the Gateway by which he quit the City. At every gateway's *Chokee*, a lower official, called *Jamadar*, was posted who demanded and received the gate pass from the property holders[15]. This City police continued to remain in context of the *Faujdar* until the twenties of the 20th Century when it were reorganized[16].

A number of sub-ordinate officials helped the *Kotwal* to maintain law and order. He appointed the *Khabris* or *Chawkayats* (spies), and other officials who furnished him with useful information. The *Khabris* or *Chawkayats* went around the City and kept on watching the activities of the people and reported to him[17]. They traced stolen property; detected crimes, unearthed plots, watched and reported irregular happenings and immoral behaviour among the officials and the public[18]. They kept him informed about movements of criminals of the City[19]. They apprehended the offenders and brought them to the *Kotwal* for punishment. The *Kotwal* would award or punish after hearing the cases but he was not empower to inflict the Capital punishment[20]. His functions were identical of those of the Mughal *Kotwal* as mentioned in *Ain-i-Akbar*[21].

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[8] In a general order of *Vaishakh Sudi* 2, V.S.1783/1726 A.D., Jaipur Records, *Kotwals* were asked to prevent hoarding of grain.

[9] Bhatnagar, V.S., *Life and Times of Sawai Jai Singh, Op.cit.*, p.288

[10] Sharma, G.C., *Administrative System of the Rajputs, Op.cit.*, p.84

[11] *Toji Chabootra-Kotwali,* V.S.1803/1746 A.D., Jaipur Records, R.S.A., Bikaner.

[12] *Bahi Khazana Hazur* (Jaipur), V.S.1774/1717 A.D. Jaipur Records.

[13] Sharma, G.C., *Administrative System of the Rajpurts, Op.cit*

[14] 'Trial of Jhoota Ram and others in 1836 A.D.', *Jaypoor- Trials*, Calcutta, 1836, p.10. At the time of this trial, Tara Chand Sravgee was the *Naib-Faujdar* of the Jaipur City.

[15] Ibid.

[16] Roy, A.K., *History of the Jaipur City*, New Delhi, 1978, p.75; In 1908, the *Faujdar* had under him 855 constables and *Chowkidars, Imperial Gazetteer of India*, Oxford, 1908, Vol.XIII, p.397.

The *Kotwal* had to keep the ruler acquainted with all the happenings of the City and to maintain records in *Bahi* or on a paper. The subordinates who assisted him were the *Mushrif, Potedar* or *Potdar, Karkun, Muharrir, Darogas, Roznamanavis, Vakiya-navis* and *Khufianavis* or *Haqiqatnavis*, *Tularas* or the weighing men, *Bindar, Chokidars* or *Chokayats*, *Hazrinavis*, etc. Besides performing their duties, these officials also maintained the necessary records at the office i.e., the *Kotwali Chabootara*, where all types of States' taxes and fines were collected[22]. The daily records of the *Chabootara Kotwali*, which were maintained by these officials, called *Rojnama Chabootara-Kotwali* and *Rojnama Potedar*, which are still preserved in the Jaipur Archives and the Rajasthan State Archives, Bikaner.

One important segment of the Jaipur City is the establishment of the *Karkhanas*[23]or the State's manufacturing departments, which were situated within the Royal Complex, so their administration was the part and parcel of that of the City. Military and domestic requirements of the State necessitate the establishment of the government owned *Karkhanas* modeled after the Mughal pattern, but with some modifications (particularly in their nomenclature) as required by the socio-cultural environment of Jaipur[24]. There were 36 *Karkhanas* in the Capital City of Jaipur[25]. Though, the credit for establishing these *Karkhanas* goes to Sawai Jai Singh, few *Karkhanas* in the *Kachhwaha* Capital of Amber were existed even before Jai Singh's period[26]. Thus, their management and administration was the important component of the City Administration.

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[17] *Chitthi* (Jaipur), 'Deep Singh's letter to *Deewan* Naraindas', *Op.cit.* This letter furnishes us with information regarding *Khoja* or *Khabri* reporting about the theft cases and movement of thieves.

[18] Sharma, G.C., *Administrative System of the Rajpurts, Op.cit*, p.85

[19] *Siyah-Hazuri* (Jaipur), *Asoj Badi* 12, V.S.1783/1726 A.D., Jaipur Records.

[20] Sharma, G.C., *Administrative System of the Rajpurts, Op.cit.*

[21] *Ain-i-Akbari*, Vol.II, tr. by Jarret, pp.43-45; J.N. Sarkar, *Mughal Administration*, Ed. II, p.70.

[22] Cf. Sharma, G.C., *Administrative System of the Rajpurts*, p.85.

[23] These *Karkhanas* had specialized manufacturing or artistic activities and where items of the State and the royal household's requirements were prepared. The chief objective behind establishing these *Karkhanas* was to provide State patronage to scholars, poets, writers, painters, musicians, dancers and craftsmen of various description, train them in their respective vocations and ensure a consistent output of utility items, arts & crafts from them.

All the *Karkhanas* worked under the supervision of a Minister *Diwan* or *Musahib*[27]. The *Karkhana* of *Bagayat* looked after the maintenance and upkeep of the

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[24] Particularly in the nomenclature, Sawai Jai Singh changed Persian names of some of these Mughal *Karkhanas*, such as, *Chitra-Grah* for *Surat-Khana*, *Agnijantr-Grah* for *Atish-Khana*, etc, G.S. Sharma, *Sources on Social and Ecconomic Hitory of Rjasthan (17th -20th Century)*, Vikas Prakashan, Bikaner, 2005, pp.206-207.

[25] In the Capital City of Sawai Jai Singh, there were 36 *Karkhanas* or departments in the various courts and yards attached to his palace. These departments were modeled after the Mughal Pattern. In Jaipur, these were popularly known as the *bavan-kutcheri* and the *chatty- karkhana*., and during the period of Sawai Jai Singh, a holiday was considered complete only when the *chhattis-karkhana* remained closed – Roop Kishore Parikh, "Chhattis Karkhana", in *Princely Terrain*, ed. by Shikha Jain, Gurgaon, 2005, p.136; G.N. Bahura has compiled a list of thirty-four *Karkhanas* from the Rajasthan State Archives at Bikaner, from *Kapad-Dwara* at Jaipur and other sources. The list runs as: (1) *Kapad-dwara*, which included- (a) *Kirkirakhana* (Woolen clothes section), (b) *Jargarkhana* (Embroidery), (c) *Toshakhana* (Wardrobe) and (d) *Khazana Behla* (Private treasury), (2) *Pothikhana* (Library and Manuscripts department), (3) *Suratkhana* (Paintings), (4) *Kheyalkhana* (Puppetry), (5) *Silekhana* (Arms and Weapons), (6) *Farrashkhana* (Tentage and furnishing department), (7) *Palkikhana* (Palanquins), (8) *Pheelkhana* (Elephant stable), (9) *Buggikhana* (Carriages), (10) *Shutarkhana* (Camel Stables), (11) *Rathkhana* (Chariots), (12) *Tabela* (Horse Stables), (13) *Gwalera* or *Goukhana* (Dairy), (14) *Shikarkhana* (Hunting), (15) *Rasowara* (Kitchen), (16) *Modikhana* (Stores), (17) *Taterkhana* (Hot Water department), (18) *Tambukhana* (Betel), (19) *Aukhandkhana*, (20) *Imaratkhana* (Building department), (21) *Mistrikhana* (Carpentry), (22) *Nakkarkhana* or *Naubatkhana* (Drums), (23) *Gunijankhana* (Department of musical performers), (24) *Karkhana Puniya* (Charity department), (25) *Bagayat* (Gardens department), (26) *Khabar* (Filigree and Intelligence), (27) *Tarakhana* (*Gota-Kinari*) (Lace work), (28) *Khusbukhana* (Perfumery), (29) *Nakhas* (Horse market), (30) *Mashalkhana* (Torch house), (31) *Patangkhana* (Kite department), (32) *Patarkhana*, (33) *Rangkhana* (Dyeing department), (34) *Raushan Chauki* (Moving orchestra). As the names suggest, some of the *Karkhanas*, such as *Tambukhana*, *Rasowara* and *Tatarkhana*, catered to the day-to-requirements of the Maharaja and other inmates of the palace. *Karkhanas* like the *Nakkarkhana* and the *Mashalkhana* were called in to contribute to the paraphernalia of State processions. This system was continued until the inception of the present Rajasthan State.

[26] Bahura, G.N. *Literary Herritage of the Rulers of Amer and Jaipur*, Maharaja Sawai Man Singh-II Museum, Jaipur, 1976, pp12-16; G.S. Sharma, *Sources on Social and Economic History of Rajasthan, Op.cit.*, pp.203-204; There is a controversy regarding the establishment of these *Karkhanas* in Jaipur. G.N. Bahura and V.S. Bhatnagar suggest that these *Karkhanas* were established by the Maharaja Sawai Jai Singh. Bahura, made *Buddhivilas* (which was written by Bakht Ram Saha in 1770 A.D. and published by Rajasthan Oriental Research Institute, Jodhpur, 1964) his basis of assumption, as it gives the reference of the establishment of '*Chhattis-Karkhanas*' in the Jaipur City in 1727. G.S. Sharma pointed out towards the fact that we find Series of *Karkhanazat* from the period of Jai Singh's ancestor Raja Ram Singh (1667 to 1689 A.D.). Thus, it is clear from the above references that the credit for establishing the core group of the famous '*36 Karkhanas*' of Jaipur goes to Sawai Jai Singh, but few *Karkhanas* in the *Kachhwaha* Capital of Amber were established even before Jai Singh's period.

[27] *Dastur-Kaumwar*, "Nathavat" (Jaipur), V.S.1878/1801AD, No.898; cf. Tod's *Annals and Antiquities of Rajasthan*, Vol.I, p.381.

State gardens, while the *Karkhana-Puniya* arranged for charities, donations and alms distributed both on a regular basis and on special occasions. The department of *Karkhana-Jat* supervised and co-ordinated the activities of various *Karkhanas*, considered either as separate units or grouped together. Every *Karkhana* was in-charge of a *Daroga*[28], assisted by *Mushrif* and other sub-ordinate officials[29]. They were responsible to maintain daily records of their *Karkhana*. Every expenditure and transaction of each *Karkhana* was recorded. These records were known as *Toji-Jama-Kharch, Toji-Imarat*, etc. Now these documents are preserved by the name *"Karkhanejat"* in the Jaipur Archives and the Rajasthan State Archives, Bikaner.

Since, Jaipur was a Capital City as well as the head-quarter of a *Pargana* ('Pargana Sawai-Jaipur'), the Offices of the state-level ministers and officials [30], such as, *Pradhan* or the Chief *Diwan, Diwans* (*Diwan-Desh* and *Diwan-Hazuri*) and *Bakshis*[31], and the offices of the *Pargana* level officials[32], such as, *Amil*, were also existed within the city walls. The office of the *Amil* was popular by the name "*Kachehri*"[33] which place is still known by this name in the walled city of Jaipur

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[28] Such as, *Daroga-i-Topkhana*, who was the in-charge of the artery manufacturing department.

[29] Sharama, G.C., *Administrative System of the Rajputs*, *Op.cit*, p.169.

[30] At the State level, there was a Cabinet of Ministers and higher rank officials. *Pradhan* or the Chief *Diwan*, who was equivalent to the Chief Minister (Raja Ayamal was the Chief *Diwan* of Sawai Jai Singh's State and his *'haveli'* or mansion is mentioned in the *'Siyah-Hazur'* papers of the year A.D.1733.), was the highest rank minister in the State and he was assisted in his multi-furious duties by the two *Diwans – Diwan-Desh* and *Diwan-Hazuri. Diwan-Desh* (Vidyadhar, the famous engineer and architect of Jaipur, was the Diwan-Desh of the Sawai Jai Singh.'s State.) under whom was the general administration of the State (*Waran-Jagir*) having revenue, civil and judicial powers and gave administrative instructions to the *pargana* official from time to time. *Diwan-Hazuri* (Naraindas was the *Diwan-Hazuri* of Sawai Jai Singh.) was the personal secretary of the King, accompanies him at the time of campaigning for the Emperor, and he had to see *Tankha, Inam Jagirs*, etc. of the King and the Royal House-hold. The Chief or *Mir-Bakshi* was the head of the army under who were his sub-ordinate *Bakshis* such as, *Bakshi-Desh, Bakshi-Tan, Bakshi-Topkhana*, etc. These *Diwans* (*Diwan-Desh* and *Diwan-Hazuri*) and *Bakshis* (the Chief or *Mir-Bakshi Bakshi-Desh, Tan-Bakshi, Bakshi-Topkhana*, etc.) formed a distinct category of senior officers who worked directly under the eyes of the ruler and the Chief *Diwan*, and supervised the work of other officials at lower levels, Bhatnagar, *Op.cit*, p.285; '*Diwan* Naraindas Kirpa Ram to Vidyadhar', *Jyestha Vadi* 6, V.S.1794/1737 A.D., Jaipur Records.

[31] *Meer* or the Chief *Bakshi* was the head of the army department and his sub-ordinate officials were *Desh Bakshi, Tan Bakshi, Bakshi-i-Topkhana*, etc. Bakshi Hemraj and Bakshi Zorawar Singh were two senior army officers of Jaipur, *Chitthii* or letter of Hemraj to Bakshi Zorawar Singh dated 12th, V.S. 1735/March, 1735 A.D.

[32] The State of Jaipur was divided into a number of *parganas*, and a *pargana* was further divided in a number of villages. At the *pargana* level, the main officials were *Amil, Faujdar* and *Kotwal*. *Amil* was the officer who was responsible for the collection of the land revenue in a *pargana*. *Faujdar* was the army officer at the *pargana* level who helped other *pargana* officials in maintaining law and order and realizing State's taxes and fines. The duties of these officials were not absolutely demarcated, some times their duties overlapped as it is cleared from the instruction orders of the State level officials.(*Chitthi* of Deewan Naraindas Kirparam to Vidyadhar, dated *Jyestha Vadi* 6, V.S.1794/1737 A.D.; *Siyah Khufia, Shravan Sudi* 9, V.S.1771/1714 A.D., Jaipur Records). When there were serious disturbances, armed soldiers were sent by the State to help the *Faujdar* (*Khatoot Ahalkaran*, Bundle

Like the other officials at lower level[34], some times the *Kotwal* had to give an undertaking that no theft or crime of any kind would take place in the area under his jurisdiction[35]. In this way, the official's responsibility to check the crime was fixed, and the officials were to keep themselves fully informed about the criminal communities residing in the areas under their jurisdiction[36]. Notorious criminals had to give in written that they would not do anything against the law in future. Only on this assurance they were released[37]. He was authorized by the ruler to decide cases of civil, revenue and criminal nature[38]. Application against his decisions could be filed in the court of the *Diwan* or the ruler[39].

No.2, Register No.278, VS 1753; Sharma, *Op.cit*, p.85). Their offices were at the *pargana* head-quarters which were established at the big town of each *pargana*. Jaipur City was the head-quarter of the 'Pargana Sawai Jaipur'. The office of the *Amil* was called as *'Kachehri'* which place is still known by this name in the Jaipur City, and *'Chabootara-Kotwali'* was the office of the City's *Kotwal*.

[33] The *Amil* listen cases daily in his office *Kachehri* at the Capital, *Siyah-Khufia, Shravan Sudi* 7, V.S.1771/1714 A.D., Jaipur Records, R.S.A., Bikaner.

[34] The *Pargana* and village officials were made responsible for stopping thefts and recovering stolen property otherwise they were liable to compensate the loss (*Siyah-Hazur*, *Pargana* Jaipur, *Kartik Badi* 3, and V.S.1784/1727AD.). It was taken in written from the *Pargana* officials, the *Patels* (the village head-men) and *Jagirdars* that no thief should remain in their territory (*Siyah Hazuri*, Jaipur, V.S.1783/1726 A.D., No.760). A *Siyah-Hazur Paper* (Jaipur, *Mangsir Sudi* 10, V.S.1783/1726 A.D., No.199.) mentions about an order of the *Diwan* instructing the *Faujdar* of *Pargana* Chatsu to take assurance in written from the *Patels* of all the villages and *Chowkayats* that no crime would take place in the jurisdiction and if it did they would be held responsible. The *Patel* was responsible for tracing thieves, recovering stolen property and restoring it to the real owner. If he failed he was either find or had to pay the assessed of the village to which the foot prints of the thief or thieves led, to trace out the stolen property, otherwise the whole village was fined equal to the value of the stolen property (*Siyah-Haqiqat*, Jaipur, *Pargana* Chatsu, *Asoj Badi* 8, V.S.1788/1731 A.D..). The *Amil* ordered that people who created mischief be disarmed and they could even be exiled, if necessary. If they wanted to live in the state, they were asked to give a written statement that they would not disturb the peace and order (*Siyah-Haqiqat*, Jaipur, *Pargana* Jalalpur, *Jeth Badi* 4, V.S.1784/1727 A.D..). Emergency measures were also taken by establishing *Thanas* or the police posts temporarily in village where the peace was disturbed by some mischievous elements, *Chithi-qrar*, Jaipur, *Bhadwa Badi* 3, V.S.1795/1738 A.D., Jaipur Records.

[35] Cf. G.C. Sharma, *Administrative System of the Rajputs*, p.84.

[36] *Siyah-Haqiqat* (Jaipur), *Asoj Badi* 2, V.S.1783/1726 A.D.

[37] *Chith- qrar* (Jaipur), *Asad Sudi* 8, V.S.1784/1727 A.D., Jaipur Records.

[38] *Siyah-Hazur* (Jaipur), *Mansir Badi* 14, V.S.1783/1726 A.D., Jaipur Records.

[39] Cf. G.C. Sharma, *Administrative System of the Rajputs*, p.90.

II

There was a separate department for the intelligence service in the State as well as in the Capital City of Jaipur, known as *Khabri* and its head-office was in Jaipur[40]. The ruler kept himself acquainted with everything in his State by means of a 'Spy System' and through which he kept a check on officials and on crimes[41]. The people of criminal communities were kept under strict observation. Their movements were reported by the secret officials such as *Khojas* or *Khabries*. If any theft or crime occurred, the suspects were arrested and an enquiry was held[42].

A *Haqiqat-navis* i.e. news writer and a *Vaqiya-navis* i.e. news reporter were appointed in the Capital. They maintained a daily report containing every happening in the City and informed the ruler. The report maintained by the *Haqiqat-navis* was known as *Siyah Vakiya*. The reports (*Siyaha Vaqiya* and the reports of the *Kotwal*) of these officials were sent to the ruler and were compared at the Capital. If they differed, an enquiry was ordered[43].

III

In the pre-modern period, there was no separation between the executive and the judicial powers. Though, the main duty of the *Kotwal* was to maintain law and order, to regulate the commercial activities and to realize certain commercial taxes and fines, he was also entrusted with the duty of dispensing justice. He was empowered to decide criminal, civil and revenue cases[44]. The *Kotwal* was the investigator, prosecutor and also the magistrate. Appeals against his decisions could be filed in the court of the *Diwan* or the Ruler. In the Capital, *Qazis* were appointed directly by the Mughal Emperor to decide cases among the Muslim community according to their religion and community laws[45].

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[40] Roop Kishore Parikh, "Chhattis Karkhana", in *Princely Terrain*, ed. by Shikha Jain, *Op..cit,* p.124

[41] Intelligence Service also worked out side the State and in this field the *Vakil,* who was appointed as the King's representative in the Imperial Court, played an important role. Besides safeguarding the king's interest in the Emperor's Court, he provided intelligence gathering from there and kept the ruler well informed about Court's activities.

[42] *Siyah-Hazur* (Jaipur), *Pargana* Bairath, *Bhadva Sudi* 9, V.S.1787/1759 A.D., Jaipur Records.

[43] *Siyah-Haqiqat, Op.cit, Pargana* Chatsu, *Phalgun Badi* 10, V.S.1788/1731 A.D., Jaipur Records.

[44] *Siyah-Hazur* (Jaipur), *Mangsir Badi* 14, V.S.1783/1726 A.D., Jaipur Records.

[45] *Siyah-Haqiqat* (Jaipur), *Pargana* Toda Bhim, *Baisakh Sudi* 6, V.S.1791/1734 A.D.

The King was the fountain head of justice. He was the Supreme-Court of law in the state and the final of appeal. He acted as an appellate authority and at times as an original court, and no subject of his state could appeal to the Emperor against the judgment given by him in any case. In the records, there are references of *Nyaya Sabha*[46] which was a moving court, provably because it was presided over by the King. Generally, the rulers heard appeals against the decisions of lower courts and could change their decisions. He could also release or pardon any criminal. His unlimited powers in practice were limited by conventions, traditions and special and customary laws[47].

The officials themselves investigate a case and then delivered judgment. Hence there existed no separation of executive and judicial powers. Appeals against the decisions of the *Kotwal* (*Faujdar* or *Amil* in a *pargana*) could be referred to the *Diwan* who investigated the case and gave his decision. If the party was still dissatisfied he could appeal to the ruler[48] but during the Sawai Jai Singh's period, we find no clear indication in the records which shows such incidences. It shows that the civilians had full faith in the judicial administration of Sawai Jai Singh.

Justice was dispensed without delay. Cases were generally decided on the same day. If all the cases could not be disposed off on the same day, the officials tried their best to decide the remaining cases before moon, the next day and informed the ruler[49]. The officials were ordered not to prohibit any body if he came for justice to the royal Court[50]. The thieves were kept in prison, which was known as *Bandighar*, or in *Kotwali-Chabootara*, with their hands and feet tied with rope. They were guarded simply by *Chowkidars*. Low caste prisoners were chained in the open fields and exposed to hot and cold extremes of weather. Some were confined in the *Kotwali* and the better class in the fort. The prisoners had to live in a narrow space where sanitation was disregarded. The state did not provide them food and clothing. Either the prisoner had to maintain himself or lived on charity[51].

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[46] *Nyaya-Sabha* Papers, V.S.1786-87/1729-30 A.D., Jaipur Records, R.S.A.Bikaner.

[47] Cf. G.C. Sharma, *Administrative System of the Rajputs,* p.90

[48] Ibid., p.91

[49] *Siyah-Hazur* (Jaipur), *Mansir Sudi* 7, V.S.1788/1731A.D; G.C. Sharma. *Administrative System of the Rajputs* pp. 87-88.

[50] Ibid, *Posh Badi* 14, V.S.1783/1726 A.D., Jaipur Records.

[51] Cf. Tod's *Annals*, Vol.II, pp.129-30; Sharma, *Administrative System of the Rajputs,* p.89; Rape was punishable with only a fine in accordance with the social status and financial position of the offender.

In the absence of contemporary references about the crimes of serious nature in the Capital, one can safely assume that the Jaipur City was almost free from such crimes during the period of Sawai Raja Jai Singh. This fact has also been born out from a 'Circular Invitation Letter' issued by the Jainas of Jaipur for participating in a festival in the City in the 1760s which mentions about crime-free atmosphere of the City in the reign of Madho Singh-I, the second successor of Jai Singh[52].

IV

Since Jaipur was found to accommodate the trade and commerce, administrative machinery to regulate these activities was also introduced. In Jaipur, a number of administrative machineries were functioning to collect taxes and fines from different commercial classes and their professions. There existed no separate or independent department or office for taxing trade and commodities. *Diwan* was the revenue minister, used to advise, and give instructions and guidance to the custom officials from time to time[53]. A number of trade routes were converged to Jaipur, consequently a number of 'custom or duty posts' called *Chowkees,* for realizing different duties and taxes, were established in and around the Jaipur City[54]. A *Mushrif, Batwal, Tularas* and a number of *Chowkayats* were posted at each custom posts[55]. Though, *Chokees* or check posts which were established at the gateways of the City came under the jurisdiction of the City *Kotwal*, the *Chokees* beyond the City limits i.e. City Walls came under another official

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A low class man was fined Rs.11 for rape of a lady of his own community (*Siyah-Haqiqat,* Jaipur, *Pargana* Chatsu, *Phalgun Badi* 10, V.S.1788/1731 A.D.). A woman was exiled for poisoning her husband (*Siyah-Haqiqat,* Jaipur, *Pargana* Chatsu, *Asoj Sudi* 5, V.S.1788/1731 A.D.). One hand and nose of a woman were amputed for murdering another woman (*Ibid, Baisakh Badi* 1, V.S.1788/1731 A.D.). Thieves were given a variety of punishments ranging from amputation of limbs, branding of their foreheads, parading them through the market on donkey's back with their faces blackened, imprisonment, whipping, exile and fines- G.C. Sharma, *Administrative System of the Rajputs, Op.cit,* p.93. An order issued by a Jaipur ruler mentions that dacoits should be killed; the limbs of thieves should be imputed and that culprits committing larceny should be branded on their fore head, *Siyah-Haqiqat,* Jaipur, *Pargana* Jalalpur, *Jeth Badi* 8, V.S.1784/1727 A.D, Jaipur Records..

[52] This letter is being quoted in the next chapter i.e. 'Emergence of the City as a Commercial Hub'

[53] Shastri, R.P., *Op,cit,* p.327.

[54] Custom posts were established at convenient points on all the principal routes from the Capital and from the important commercial centers.

[55] *Siyah Haqiqat, Pargana* Hindaun, *Chaitr Badi,* V.S.1788/1731 A.D., Jaipur Records.

i.e. *Amil,* as in each *Pargana,* he was in-charge of the custom posts established in his jurisdiction[56].

The *Kotwal,* in addition to his executive, administrative and judicial duties, was the chief custom officer in the City and he had to function as the head of the machinery extended with the task to collect taxes. Besides collecting custom and excise duty, he had to collect taxes, namely, *Mapa, Hatwada, Hasil* and fee for weighting the goods, etc. All the taxes imposed on merchandise or trade came to be known collectively as *Zakat*[57]. In discharging his duty regarding collection of taxes, he was assisted by the *Mushrif, Potedar*, *Karkun, Bindar, Batwal, Tularas and Chawkayats* under him[58]. It was the duty of the sub-ordinate officials such as *Chowkidars* or *Chawkayats,* to go round the town and visit the market places and keep a watch over business transactions[59]. It is clear from the Jaipur Records that the tax collected was daily recorded by the sub-ordinate officials under the custom officer[60]. As far as, the salaries of these tax collecting officials are concerned, it was the practice to pay the *Kotwal* in cash, and the sub-ordinate officials were generally paid in terms of the percentage of the amount collected as tax[61].

The goods, which were brought to the market to be sold, were weighed by the weighing men or *Tularas.* Representative of the *Mushrif, Daroga* and *Karkun* were required to be present to record the weight. The weights of the goods were reported to the *Italanavis* or *Vaqiyanavis* and *Haqiqatnavis* who sent detailed information to the *Diwan.* The amount calculated according to the weight, was realized from the trader and he was given a receipt for it. He kept this with him to show it on demand and save himself from harassment at the hands of officials. If a trader tried to evade the tax or hide the real weight of his goods and was caught by the *Chowkidars* or *Chowkayats*, he was produced before the officials and had to pay many tomes the actual tax as a penalty. The amount of penalty was decided by the chief custom official arbitrarily[62].

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[56] Ibid.

[57] Ibid, p.99; During the Sultanate and the Mughal periods, this was primarily a religious tax realized from the Muslims and the amount was spent on their welfare- I.H. Qureshi, *Administration of the Sultanate of Delhi*, ed., 1971, p.96. The Rajput rulers adopted it and all the taxes imposed on merchandise came to be known by different names in different states. In Jaisalmer and Mewar, these were known as *Dan* and the collectors as *Dannie*, while in other states as *Sayar* or *Zakat*- G.C. Sharma, *Administrative System of the Rajputs, Op.cit*, pp.99-100. The *Zakat* or *Shayar* included all those imposts levied and collected at each custom posts, *Ibid*, p.100.

[58] *Shiyah-Haqiqat*, *Pargana* Naraina (Jaipur), *Chaitra Badi* 10, V.S.1788/1731 A.D., Jaipur Records.

[59] *Khatoot-Ahalkaran* (Jaipur), Bundle No.4, Reg. No.302, V.S.1769/1712 AD, Jaipur Records, R.S.A.B.

[60] *Rojnamchas* of *Potedar* (Jaipur), V.S.1783/1726 A.D., Jaipur Records, R.S.A., Bikaner.

[61] *Siyah-Haqiqat* (Jaipur), *Pargana* Ghazi-Ka-Thana, V.S.1788/1731 A.D., Jaipur Records.

The amount, which was collected at the *Chabootra-Kotwali,* was sent to the State Treasury (under the seal of custom officials), after meeting the expenses of establishment. If it was not sent, the appropriation of money was ordered by the *Diwan*[63]. Weekly reports of the custom posts and *Chabootra-Kotwali* (*Kotwal*'s office) were sent to the *Diwan*'s Office. The amount sent to the treasury was compared with the details maintained by the *Daroga* and the report of the *Italanavis* or *Haqiqatnavis* at the *Diwan*'s Office and an enquiry was ordered if there was any discrepancy[64]. The person concerned was called upon to explain them. If found guilty, he was either removed from service or fined for dereliction of duties. The copies of all *Parwanas* and *Sanads* exempting traders from different taxes were sent to the officials for their guidance[65]. The officials were warned from time to time not to realize any illegal cess or more than the fixed rates of the tax[66]. A check was kept on custom officials, through the *Italanavis*, *Vaqiyanavis* and *Haqiqatnavis* but still there were complaints against the officials for realizing excess duty or illegal taxes[67].

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[62] *Siyah Haqiqar* (Jaipur), V.S.1788/1731 A.D., Jaipur Records, R.S.A., Bikaner; The collector of duty was paid salary in cash at the Capital and big towns, and which differed from *Pargana* to *Pargana* according to the importance of the place or the amount of work involved. The numerous sub-ordinate officials were paid a percentage of the sum collected at the custom posts. This induced them to discharge their duties efficiently so that they could earn more.

[63] *Chithi-qrar* (Jaipur), V.S.1767/1710 A.D., Jaipur Records, R.S.A., Bikaner; The *Patel* or *Chaudhry* of every village was the collector of customs and other cesses. He deposited the collecting in the *pargana* treasury. He was paid some percent of the collection made as his remuneration, Sharma, cf. G.C., *Administrative System of the Rajputs*, p.102.

[64] *Siyah-Haqiqar* (Jaipur), *Pargana* Pahadi, *Chaitra Sudi* 2, V.S.1782/1725 A.D., Jaipur Records, R.S.A.,Bikaner.

[65] *Siyah-Hazuri* (Jaipur), No.646, *Asoj Sudi* 7, V.S.1783/1726 A.D., Jaipur Records, R.S.A., Bikaner.

[66] *Chithi-qrar* (Jaipur), *Maha Badi* 2, V.S.1767/1710 A.D., Jaipur Records, R.S.A., Bikaner.

[67] Ibid.

CONCLUSION

The city of Jaipur was founded by Sawai Jai Singh to make it a commercial hub or a centre of trade, an administrative centre, as well as, a centre of scientific learning, particularly in the fields of Astronomy and Mathematics. A number of inferences can be drawn from the analysis and study of the aspects and intricacies of the foundation and early history of Jaipur City.

The foundation of the new capital city of Jaipur could be justified by two plausible factors – the political dominance which the State of Amber had already acquired in erstwhile Rajputana under the patronage of the Mughal rulers, and the need for an environment that would be suitable as the new capital of the State. The foundation of Jaipur was too an outcome of new economic dimensions. Economic shift from agriculture to trading and commerce compelled the *Kachhwaha* Ruler to establish a new capital city having conducive commercial atmosphere.

The city plans, which were prepared by the master architect and his associates, submitted to the Maharaja for his instructions and approval, and when all the plans were approved, the foundation of the new city was laid. The walled city of Jaipur was founded in many successive stages. The buildings of the City and its surrounding walls and gates were started with official ceremony in Nov. 1727 A.D. During the lifetime of Sawai Jai Singh eight gateways were built in the walled city of Jaipur and which are still extant. After the completion of the palace, basic layout - main roads, the city wall and its gateways, Jai Singh started the construction of the masonry shops with uniform shape and size on the cardinal roads. After the official foundation of the city, Jai Singh invited influential merchants and traders, and artisans and craftsmen from different parts of Rajasthan and other places to settle down in the city and to do business there. Just after completion of the main wards of the city of Jaipur, Jai Singh had applied to the Mughal Emperor for the imperial recognition of his new capital city, which was officially recognized by the Emperor to be the capital of the Kachhwaha State, after seven years of its foundation.

Nomenclature of the localities in the city suggests that Jai Singh and his architects used names prevalent in the contemporary Rajasthan and Shahjahanabad. The names of *Chowks* or the squares are indicative of the Mughal planning system inspired from the palatial structures of Shahjahanabad.

Jaipur was founded as a fully planned city as confirmed from the layout of its artery roads and streets, and the uniform look of its main markets. The planners of the Jaipur City planned it keeping in consideration of the topography of the area. But it took some time to plan and manage for adequate resources and competent planners to carry it out successfully according to Jai Singh's wishes. Jaipur was regularly planned through the contours of the site inhibited the complete realization of the ideal square, particularly in the initial stage of its foundation. The plan of the city was developed initially with perfect symmetry in the four square sectors where central one was reserved for the Royal Palace Complex, second for Rajput Thakurs, third for leading courtiers, and the fourth one for traders.

The walled city of Jaipur is broadly divided into two portions by a long and very wide main axis-road running east to west from Surajpol to Chandpol Gate, though which is slightly inclined to the south-east direction. This road is crossed at right angles by three other straight roads having almost the same width, dividing the city in many rectangular blocks or *Chaukris*. Thus the town planning of the walled city of Jaipur follows the 'Grid-Iron Pattern' or the 'Chess-Board System' of street planning. All together, there were nine blocks, and all the blocks, except the Palace, *Gangpol Chaukri* and *Brahmapuri*, seems to be of almost equal size. In this way streets are either parallel or perpendicular to each other. The width of the streets decreases from the main roads to by-lanes. The blocks are further sub-divided into the smaller rectangular and square blocks by a large number of block streets and lanes parallel to both the cardinal axes and again crossing each other at right-angles. At the crossing sections of the east-west axis road and the other three perpendicular main roads, there formed three *Chowks* or the squares with a side three times the width of the main road.

The old city of Jaipur is enclosed by the fortified wall. The ditch or moat around the city wall is conspicuously absent, though medieval cities generally were accomplished with enclosure and moat. It is the fortification wall which gives the shape of an irregular rectangle to the city, due to its projection in the north-western side. At present, the wall is absent in the north-west of the city. But there are remains of the old city wall around *Brahmapuri*, observed on the road to Gaitor. The city wall of Jaipur was naturally protected from three sides by the hills but the southern city wall is without any natural defense. The peripheral demarcation of the city i.e. the city walls were guided by the location of its gateways.

Jai Singh introduced a new dimension to architecture. The uniformity of the walled city - the almost uniform height and similarity of architecture of the houses and shops built on the main roads - was very striking. This is specially striking on both sides of the *Johri Bazar*. In some part of the city, the top of these buildings have been decorated with domes and arches, and most such buildings enshrine temples. The beautiful effects of these external decorations are also seen on the buildings situated on the east of the *Sireh-Deori Bazaar*.

The areas in rectangular plots were allotted to individuals and temples, etc., and the square plots were kept reserved for the prominent persons of the state. The location and the type of *haveli* or mansion were determined by the owner's socio-economic and political conditions that is the caste, occupation and the relation with the ruler. There are some beautiful but abandoned *havelis* in *Ghat-ki-Guni*, which belong to a unique building type of tiered garden *havelis* adhering to symmetrical and axial planning. In many respects, the complex presents the basic principles of architecture. The facades of the structures are symmetrical and contain elements showing definite rhythm and symmetry. The complex depicts the use of all architectural elements of Rajputana Architecture including the *bangla* roof, domes, twin columns, trefoil and cusped arches, wide eaves and brackets with materials- rubble and render- and finishes as used in the walled city.

The contribution of Jai Singh was enormous in founding and making the city of Jaipur as a centre of scientific learning- especially in the fields of Astronomy and Mathematics. Voluminous work on scientific literature was produced by a galaxy of scholars under his patronage. Before Jai Singh, the Indians had no astronomical instruments of precision of their own, neither were they interested in making practical observations of the celestial bodies. Jai Singh tried to synthesize the existing three schools of astronomy- the Indian, the Central and West Asian, and the European. After a thorough analysis of the collected subject material belonging to these three schools, he made improvements and innovations in the field of instrumentation, and after taking astronomical observations for a long time at different places, he prepared the more accurate astronomical tables and tried to find out, the patterns in the motions of the celestial bodies so that their future phenomena might be forecasted and more accurate calendar could be prepared. The methodology, followed by him in achieving his scientific goals, systematically covers almost all dimensions necessary for the scientific research and development i.e. 'institutionalization' of the scientific learning, 'instrumentation and observations', and 'theorization' of the observed data. The organization of observatories was not a whimsical development or a mere copy of the earlier developments but it was a major development of the tradition, with innovative contributions in the fields of instrumentation, observations and theorization.

Jai Singh became well acquainted with Indian and Greek mathematics, and up to some extent, he was aware of contemporary European developments in the field of mathematics and had acquired various Greek and Arabic works as well as other European texts dealing with the subject. He himself wrote a book on mathematics, which was a major contribution, and is similar to the efforts made by earlier scientists, such as Al-Tusi, Al-Kashi and Al-Kuschi. Further more, the use of mathematics in astronomy was not an accident or of limited potential, as would be evident from its extensive use in the planning of the Jaipur City and in the instrumentations. Besides, he used mathematics in his Intelligence Service, in the codification of secret messages. Trigonometry and trigonometric values developed in India provided a direct link between mathematics and natural sciences, in this case, astronomy. The linkage of mathematics with instrumentation as well as observational astronomy (natural science) is also extremely important, because some scholars have suggested that the main reason for the non-development of scientific tradition in the non-European culture areas was the absence of this linkage.

Despite all his achievements or contributions and innovations in the field of instrumentation, Jai Singh also had some limitations. He did not follow completely the line adopted by the revolutionary European astronomers, such as, Copernicus, Kepler and Newton, and remained dependable to the traditional one (the 'geo-centric' system). It seems that Jai Singh was not wholly responsible for this and the prevailing circumstances also played a crucial role. By the time Jai Singh became acquainted with the progress made by the European astronomers, he had already partially carried out his own scheme of astronomical research, and considerable work had been done on his tables with the help of the data given by the Delhi Observatory built a few years ago. Jai Singh's European advisers, who were mostly Catholic priests, did not fully emphasize the importance of the researches of Copernicus, Kepler and Galilei Galileo. More recent European discoveries might have been discredited in Jai Singh's eyes because of the reason that till the life time of Jai Singh i.e., before mid-18th Century, the direct benefit or outcome of these discoveries had not appeared in the European societies.

The lack of institutionalization of the scientific knowledge at the mass level was the main degenerating factor behind scientific and technological backwardness in the non-European countries including India, during the pre-modern period. Jai Singh had realized this fact, as he took initiative to establish the astronomical observatories at five different places, and further, tried to institutionalize the mathematical science- on the mass level in India by making plans, although they could not be materialized, for establishing a large number of observatories throughout the Mughal Empire. Unfortunately, Jai Singh's efforts in the field of scientific research and his future projects for its development came to an abrupt end after his death in 1743 A.D.

With in a few years of its foundation and shifting of the Capital from Amber to Jaipur, the city of Jaipur prospered quickly and became the largest- as its estimated population comes out to be about 50,000 - and richest city of Rajasthan during the period under review (from its foundation in 1727 A.D. till the mid-18th Century). Besides being a leading centre of transit trade and flourishing market and an important centre of manufacturing in various articles, viz. woolen clothes and fabrics, *gota-kinari*, pottery, enamel work on gold, silver and brass, the marketing system of Jaipur was well organized and its was renowned for 'banking and exchange' operations. The emergence of the city as a commercial hub or a centre of trade during the second quarter of the 18th Century was due primarily to the 'geo-political' conditions which prevailed in Rajasthan after the death of the Emperor Aurangzeb and the rapid weakening of the Mughal Empire and its administrative structure. Though, situated at the junction of many important trade routes connecting famous trade centers of Rajasthan as well as other parts of India, Jaipur got tremendous growth in trade further with the shift of some important trade routes which connected Delhi and other important centers of Northern India and passed through Punjab. Due to the disturbed condition in the Punjab, traders changed their trade-routes and adopted other routes which passed through Jaipur.

Jaipur emerged rapidly on the commercial horizon in the critical scenes of the first half of the18th Century. Besides its geo-political conditions which contributed a lot in its rise, the main credit seems to go to the state-policy i.e. Jai Singh's initiatives in the economic field, especially his policy towards various socio-economic groups, local industries and organization of the markets, was the main generative factor behind it. A large number of merchants, artisans and bankers were invited from different parts of the country to settle down in the city and various facilities and incentives to them were provided by the State. The ruler took keen interest in the growth of indigenous production which was preferred while making purchases for State's use. By establishing *Karkhanas* in the city, the State gave patronage to artisans and craftsmen of various descriptions, local as well as migrants, trained them in their respective vocations and ensure a consistent output of utility items, arts and crafts from them. The artisans employed in the royal *Karkhanas* or engaged in private industries, which were usually managed by skilled artisans, received patronage of the State in production. It was because of State's effort that a large number of skilled craftsmen from all over the country came and settled in Jaipur, and consequently handicrafts received a great impetus.

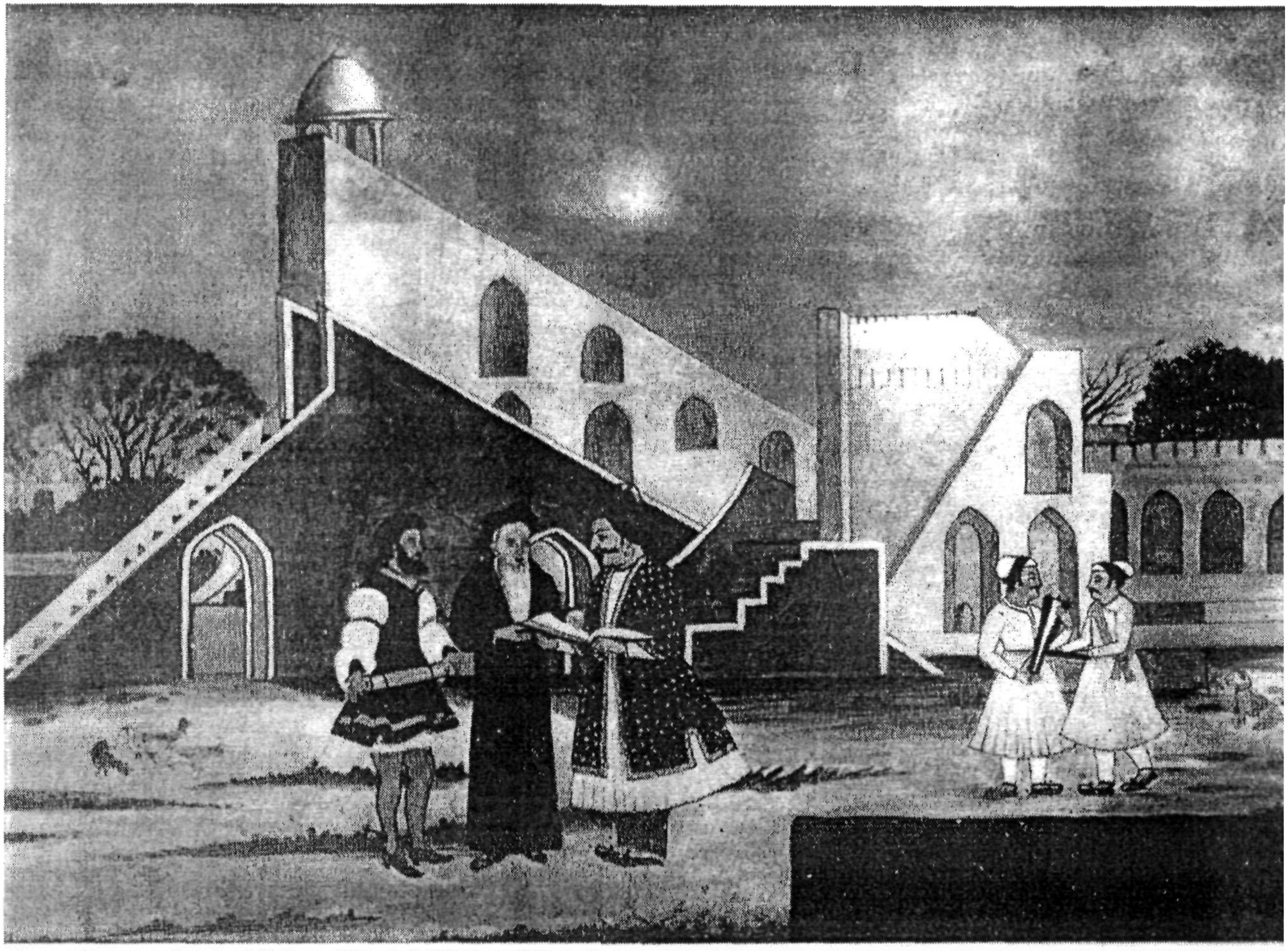
The success and smooth functioning of the city to some extent lies in providing full fledged water system to cater the needs of the dwellers of the city. The city of Jaipur and surrounding area was embellished with a well developed hydraulic system. There was an elaborate system of water management- rain water collection, its conservation and supply system. The whole system was made in such a way that every effort was made to ensure the optimum utilization of it. The rivers – Jhotwara, Banganga, Banas, and Darbhavati - were surveyed and the natural channel of each was taken into consideration, and water was channelized towards the city through a number of water canals. In the area, there found many types of masonry water bodies which may be categorized as: water bodies for storage, inlet and outlet channels or the distributory channels, water cistern or the filtration chambers and water works for pleasure. The water management system of Jaipur was composed of canals, dams, reservoirs, ponds, tanks, *kunds,* wells, step-wells, channels, aqueducts, etc. Basically this system facilitated the conservation of rain water and its distribution for catering the various human needs within the city and outside as well. Besides, a precaution has been taken to device the water system in such a way that it may be available for cattle and other animals. Thus, water was not only channelized, stored, carried over long distances but also distributed among the various parts of the city.

In general, there was the stability, peace and prosperity in Jaipur during the period of Sawai Jai Singh which proves the existence of an efficient administrative system which functioned effectively there. Fixing of responsibilities of the individual officials both locally and collectively, and their check and balance by strong surveillance over the functioning of whole administrative machinery with the help of a well organized spy-system or the intelligence service, were the main factors behind effective functioning of his administrative system. The peace and stability in Jaipur, during Jai Singh's period, was in no small measure due to the efficiency of his intelligence service, which kept fully informed about the conditions in his own expanding State and those in the vast though tottering Mughal Empire and helped him in his diplomatic dealings with the various powers, and enabled him to concentrate and devote sufficient time to his scientific pursuits.

Finally, it could be summed up without any exaggeration that the foundation of Jaipur City in the early eighteenth century had a historical significance. Further, the emergence and early history of Jaipur City, beyond any doubt, indicates towards the important development at regional level in the fields of economy, political stability and sciences, while in the wider scenario, there was general decline and decay at central level in the eighteenth century Mughal Empire.

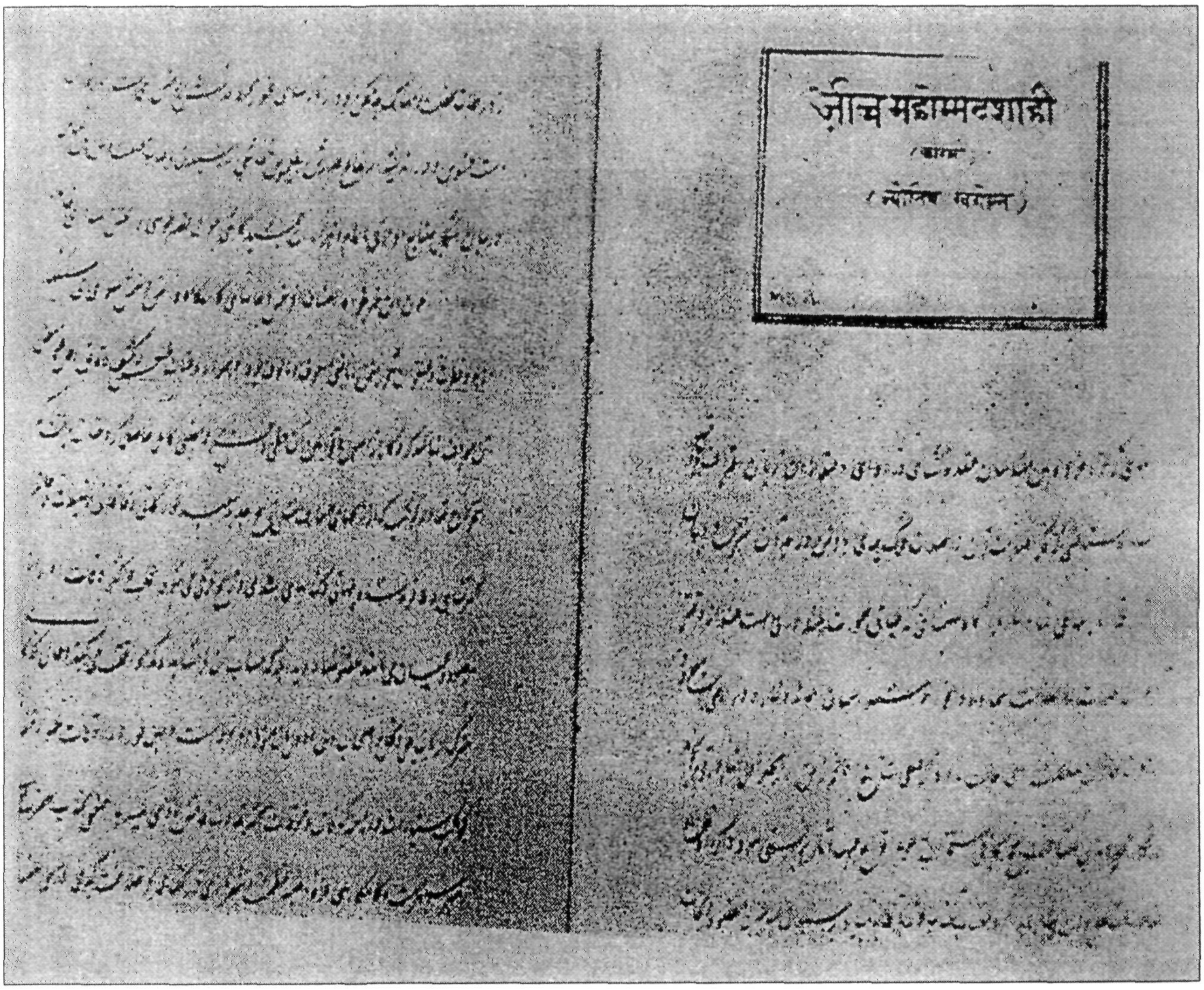
APPENDIX

APPENDIX - I



Father Manuel De Figureido presenting astronomical charts and books to Jai Singh on the ground
of Jaipur Observatory in 1729 A.D. (No. A.G. 2310, M.S.M.S. Museum, City Palace, Jaipur).

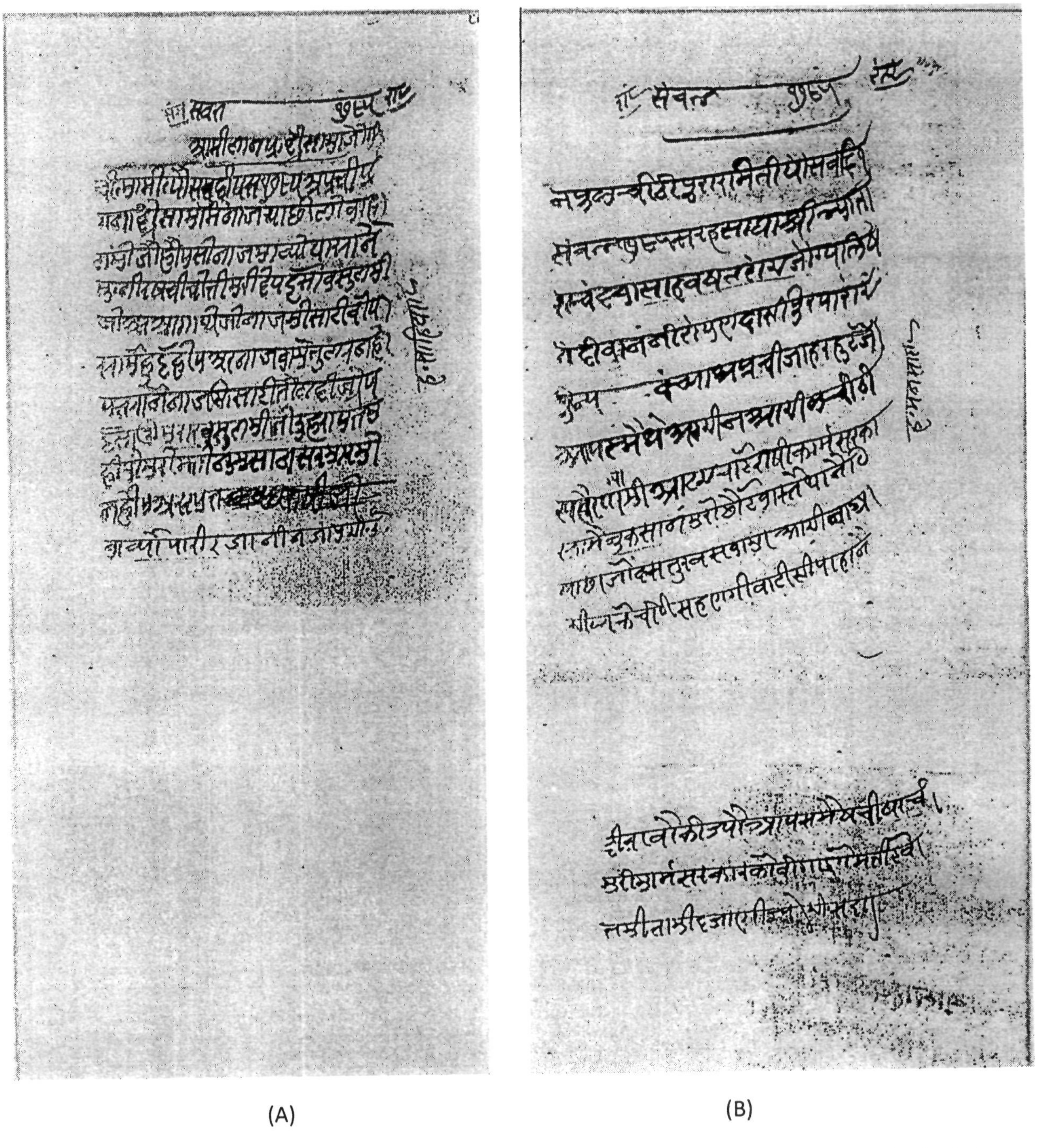
APPENDIX - II



ज़ीच महोम्मदशाही

A facsimile of the preface to the *Zij-i-Zadid-Muhammad Shahi*, City Palace (*Pothikhana*), Jaipur; Also available at MAL, AMU, Aligarh.

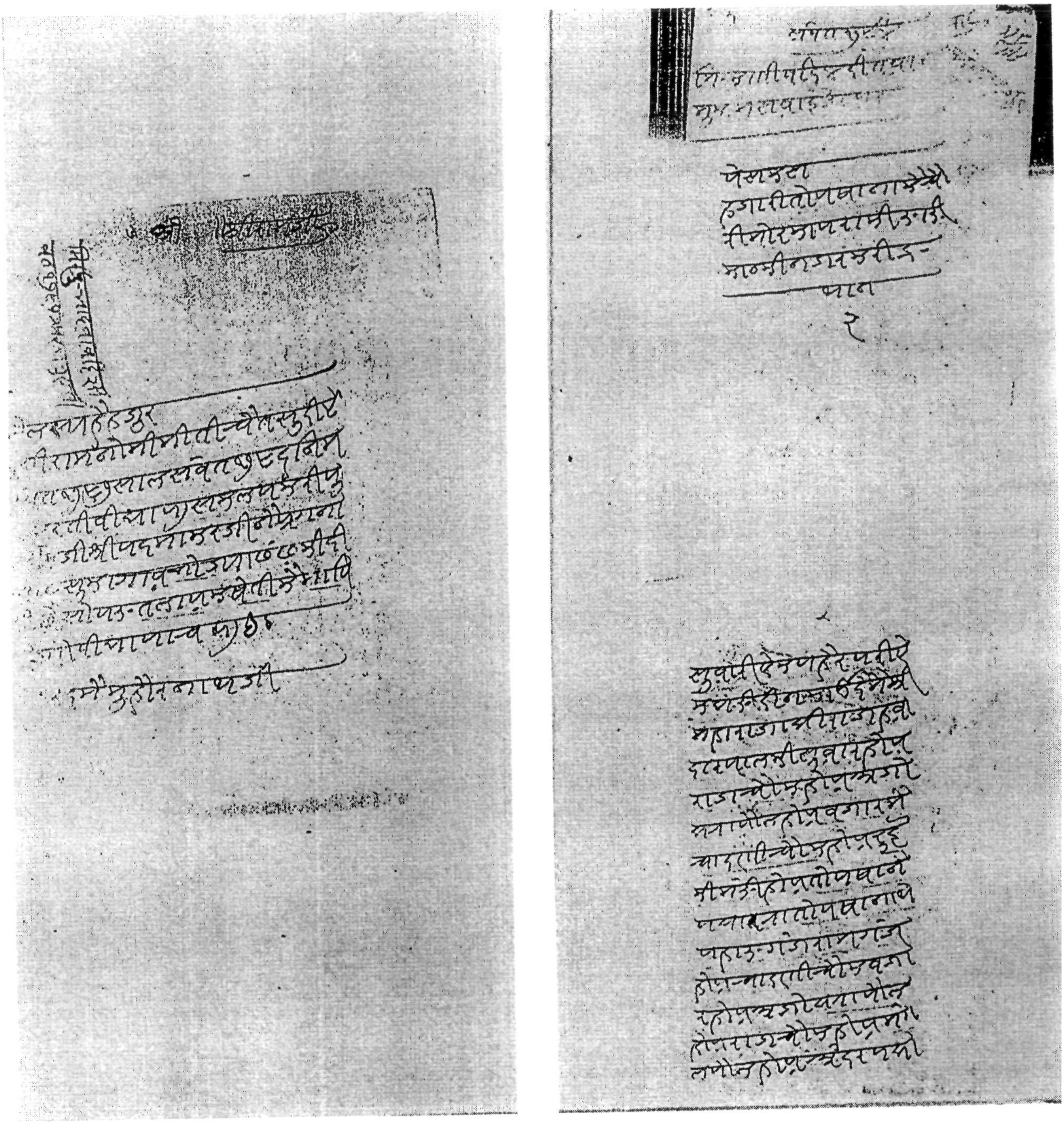
APPENDIX - III



(A) (B)

Chitthis (Letters) (A) dated *Posh Vadi* 4, V.S.1784/1727AD and (B) dated *Posh Vadi* 1, V.S.1784/1727 A.D., Jaipur R.S.A., Bikaner.

APPENDIX – IV



(A) (B)

Dol Siyah-Hazur (A) dated *Bhadra Vadi* 2, V.S.1787/1730 AD and (B) dated *Kartic Vadi* 4, V.S.1794/1737 AD, Jaipur Records, R.S.A., Bikaner.

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(A) ARCHIVAL RECORDS

Jaipur Archival Records: *Kapaddwar* Records or the records of the house-hold department, some of the documents are preserved in the City Palace at Jaipur; but a descriptive catalogue of these documents has been given to the Rajasthan State Archives, Bikaner. The categories of documents preserved in the Jaipur Archives are given below:

1. *Siaha-Hazur*: these report daily occurrences at the court of the Jaipur rulers, their visits to the town, temples or the residence of some celebrated scholars, like Ratnakar Paundarik or to visit nearby built palace or lake.
2. *Dastur-Komwar* Papers: give more varies information-social, cultural, economic and political.
3. *Arsattas*: these are the main source of economic importance.
4. *Arzdasthts:* sent by the officials of the Jaipur State or of other states to the *Kachhwaha* rulers.
5. *Yaddashti:* orders to the *amils* of different *Parganas* and *arzis* or applications of junior officials.
6. *Khatut-Ahalkaran*: letters written by one official to the state to another.
7. *Kharitas*: letters written by one ruler to another, including those of the state out side Rajasthan.
8. *Draft-Kharitas*: letters sent from Jaipur to the various rulers.
9. *Parvanas*: letters written by the rulers to their senior officials or to those of the other states.
10. *Wakil* Report: the reports sent to the ruler by the *wakils* of the state posted at the Mughal Court. After 1710, most of the *wakil* reports are in Rajasthani.

11. *Waqiya* Records: these papers record personal and official activities of the ruler.
12. *Akhbarat*: *Akhbarat-i-Darbar-i-Maula,* Persian *Akhbarat* record court incidents, orders, doings and observations, of the Emperor, appointments, promotions, etc.
13. *Farmans*: the *Farmans* of the Emperors, chiefly of Jahandershah, Farruk-Siyar, and Muhammad Shah.
14. *Nishans*: letters written by the Mughal Princes to the Rajput rulers.
15. *Iqrarnama*: documents recording agreements.
16. *Hasb-ul-hukm*: letters of high Imperial officials issued by order of the Emperor under seal.
17. *Mahzarnama*: reports of enquiry.

Bikaner Archival Records: The *Kapaddwara* records, most of the records here been handed over to the Rajasthan State Archives at Bikaner, a descriptive catalogue of these documents is available here in the Jaipur Records Section.

Dastur-Kombar: are the records of the *dastur* or protocol or wage observed in respect of persons of different castes, communities and social status who met the ruler or whom the ruler paid a visit. The govt. of Jaipur had got these records prepared from the *Tauji* records and had preserved there in 32 bound volumes. There are two index volumes also; records have been arranged cast wise in these volumes. The period covered is 1718 to 1918. All the volumes are now in the Rajasthan State Archives at Bikaner.

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Potedar or the city's treasurer. These records are very important from the economic point of view and some of them throw light on other aspects, such as, foundation and town planning of the Jaipur City.

The *Nushkha-Punya* (*Devasthan*) records are highly informative regarding the religious condition of Jaipur. They gave accounts of the temples, donations, priests attached to the temples, etc. Some of them have been copied in bound volumes. Some of the letters sent by the Bikaner rulers to Amber are preserved in Jaipur Archives.

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